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THE MONTECATINI CONCERN and its activities

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MONTECATINI

SOCIETA' ANONIMA PER L'INDUSTRIA MINERARIA E METALLURGICA

MILANO

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SIXTY YEARS' INDUSTRIAL DEVELOPMENT

The MONTECATINI Concern is today the most powerful industrial organization in Italy, and occupies a position of the highest importance among the world's biggest industrial enterprises working in the field of mining and chemical production. This industrial Concern, which includes over 40 amalgamated, associated or affiliated Companies, employs nearly 53,000 workers and owns 159 production units (factories, mills, mines, etc.) working at present, has today reached a glorious sixty years' life.

The rapid process of development and expansion which has brought Montecatini to the present position is somewhat similar to the history of the biggest chemical industries in the world: Du Pont de Nemours in the U. S. A., Imperial Chemical Industries in Great Britain, etc.

It is the result of an energetic and intelligent use of the possibilities which modern technical progress opens up for the exploitation of several raw materials in the field of chemical industry.

This is the basic principle, fully conforming to definite technical and economical laws, which has directed Montecatini's formation and development. Established as far back as 1888, to work a copper mine at Montecatini (in Val di Cecina), from which town it took its name, the Company started with an experience in mining which was to be of great service when its activities extended to other fields.

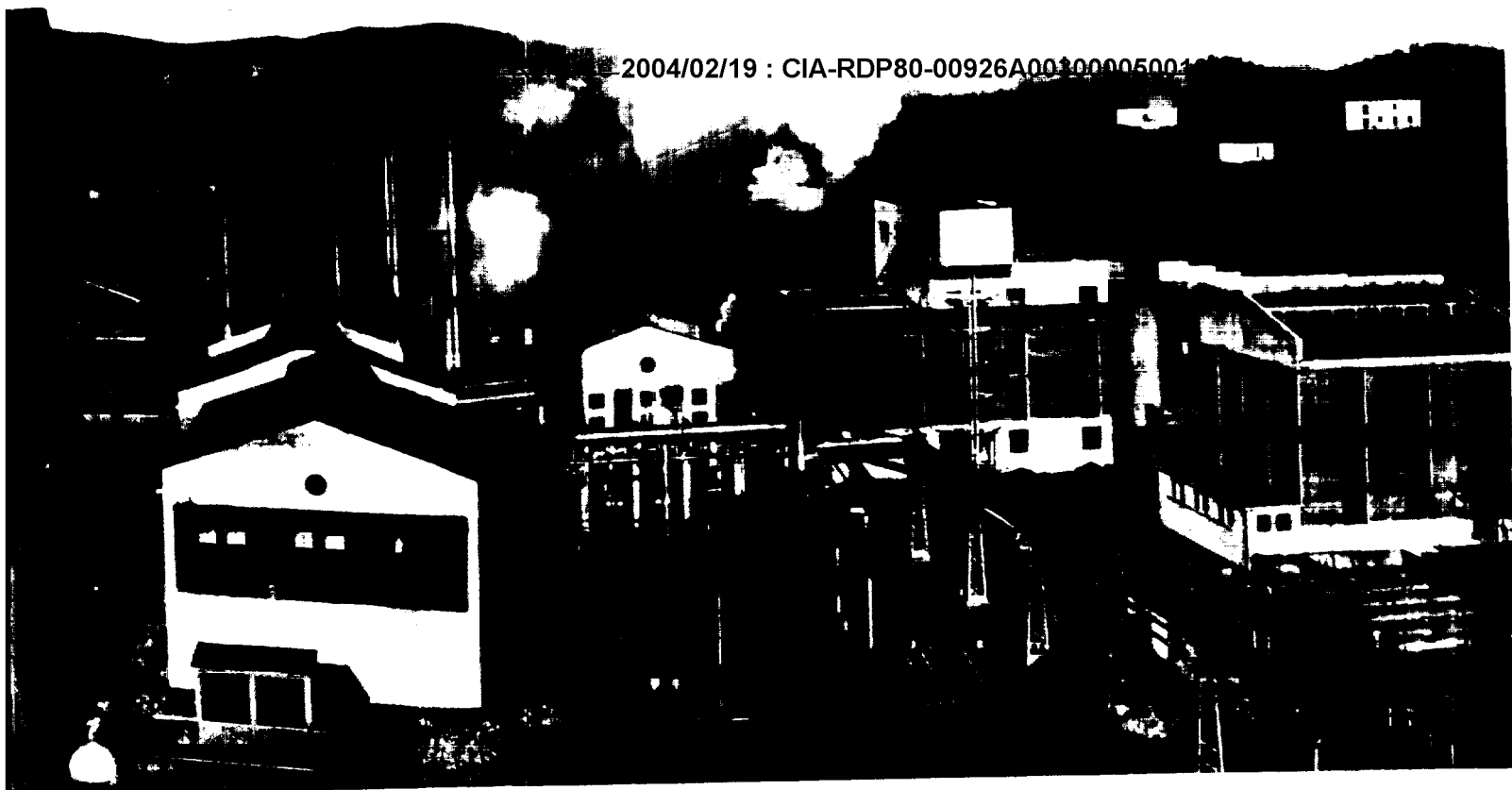
In 1910, when Guido Donegani, an engineer, became its manager (a position he kept until 1945), Montecatini was still a small-sized Company; it was in 1917-1920 that the gradual ascent had its beginnings. In those years two decisive advances were made: firstly the development of activities in the sulphur sector, by which the Company acquired the mines and refine-



of the Romagna and Marche districts; secondly, the first decisive interest in the chemical industry, represented by the purchase and amalgamation of the major industrial companies then existing for the production of sulphuric acid and mineral superphosphate, by which Montecatini acquired a large number of plants all over the Italian peninsula. To sanction these important developments, by the end of 1917 the style of Montecatini was changed to « Società Generale per l'Industria e l'Agricoltura » (General Company for Industry and Agriculture), later altered to « Società Generale per l'Industria Mineraria e Chimica » (General Company for Mining and Chemical Industry).

During the second period of Montecatini's history, from 1925 to 1927, the most notable development, be it for the magnitude of the capital and work involved, the highness of ideas devised and realized and the general importance of technical and economical results and possibilities, was undoubtedly the starting of a synthetic nitrogen industry. This period teemed with intense research and courageous practical realizations; entering the nitrogen field, which is technically the most difficult sector of chemical production, Montecatini gave a final proof of its

SAFETY AND SECURITY
General Company for Mining and Chemical Industry



possibilities. The same year also saw the development of the explosive industry.

In the third period, from 1931 to 1934, Montecatini developed along three main lines: active participation in the intermediate and dyestuffs industry, selective rearrangement of the general organization, both from a financial and a managerial viewpoint, and strong expansion in the mining and chemical fields. Thus Montecatini started producing lead, zinc and bauxite minerals, together with the building of plants for the processing of the metals thus obtained (Società Monteverchio and I.N.A.); many other fundamental production cycles were started, among which we may mention synthetic camphor, acetate rayon (Società Rhodiaceta), varnishes, iron oxides, glues and gelatins, pharmaceutical products (Società Farmitalia), synthetic resins. The next ten years (1935-1945) were also notable for a progress that in some fields may well be called imposing: petrol production was greatly developed (Società A.N.I.C.); a whole industrial production of basic drugs (Società Farmitalia), and a complete range of synthetic resins were also produced, besides hundreds of various chemical products. In this period 300 kms of new electric power lines and two new power stations were

Nitrogenous Products Plant
(Montecatini Co.)

also built. Montecatini built moreover, at Novara, an Institute of Scientific Research, which is the largest in Italy, and, in Milano, a building for the central administration offices which may be classed among the largest and most modern in Europe. At the same time intense geological and geophysical prospectings were carried out, researches made, new mines opened; vast industrial plants were built, such as the S. Giuseppe di Cairo and Apuania works. Then the war came, hitting the whole of the country with disastrous violence, and bringing terrible destructions to all fields of Italian life.

Restricted allocations first, and shortages of raw material supplies later, began to slow down production; then, when the guns came to be firing on cities and towns, many of plants found themselves in the center of territories long disputed by the various armies fighting on our soil. From Palermo to the Alps practically all units of the Concern suffered from the consequences of war. Factories and mines were destroyed, plants were wrecked or removed by the Germans, stocks were exhausted; such was the gloomy balance drawn towards the middle of 1945, when hostilities came to an end. Out of a total of 181 productive units, less than one third were still working, and these too only to a very limited degree of capacity. But Montecatini did not lose any time in beginning the huge, twofold task of reconstructing destroyed or damaged plants and reconverting all plants from war to peace production. This work was carried on at record speed; by the end of 1945, 76 production units were working, while less than 50 had been active at the beginning of the year; by the end of 1946 the number had risen to exactly 100; 107 in April 1947; 140 in December. Today factories and mines functioning have risen to the number of 159.

Reconstruction also took in hand the elimination of inefficient units, the improvement of production cycles, and the setting up of modern machinery, so that many plants are now among the best in Europe in technical efficiency. Production capacity has already risen above pre-war level in some fields.



The Montecatini Copper Mine
in Val di Cecina

PRODUCTION CYCLES

The fundamental activities of the Concern are four: mining, metallurgical, chemical and electrical industries. To these, other activities of a subsidiary character are added. We give now a short description of the work carried out in every sector, showing the results Montecatini has achieved.

MINING INDUSTRY

Pyrites Pyrites, together with sulphur and mercury, is one of the minerals in which Italy has a first rank producing position with respect to other countries.

Pyrite was one of the first activities of Montecatini for in 1910 the whole Concern's production was centered around the pyrites mines of Gavorrano and Boccheggiano, near Grosseto, and Agordo, near Trento. The Grosseto region is for this mineral the most important in Italy; in 30 years' efforts Montecatini improved and expanded machinery and methods of extracting in those mines, carried out much prospecting work, opened new mines, built adequate systems of transportation (cable ways 15 kms long were built between the various mines and the collecting centers at Scarlino and Portiglioni, where a special port was also prepared).

In the period from 1910 to 1935 production of pyrites around Grosseto was increased nearly ten times. At the same time Montecatini took over pyrites mines in other parts of Norther Italy: Brosso, near Aosta, and Calceranica, near Trento. Besides increasing pyrites exports, Montecatini has been utilizing pyrites cinders since 1926, first extracting their copper content, then sending them to iron works for further use. In conclusion Montecatini has greatly increased the industrial importance of this mineral, which is now the basic raw material of its chemical industry.

Yearly production of pyrites, which was from 700,000 to 800,000 tons in the five years before the war, reached nearly one million tons in 1940; 200,000 of which were exported. At the end of the war output was greatly reduced; in 1947-48 however it reached pre-war level.

Sulphur Sulphur mines in Italy are concentrated in Sicily and in the Marche-Romagna territory. Montecatini entered this industry in 1917, when it took over a number of mines in the Marche besides the Cesena, Bellisio and Pesaro works. Sulphur production on the mainland was then 30,000 tons per year; after less than 20 years it had grown to 100,000 tons.



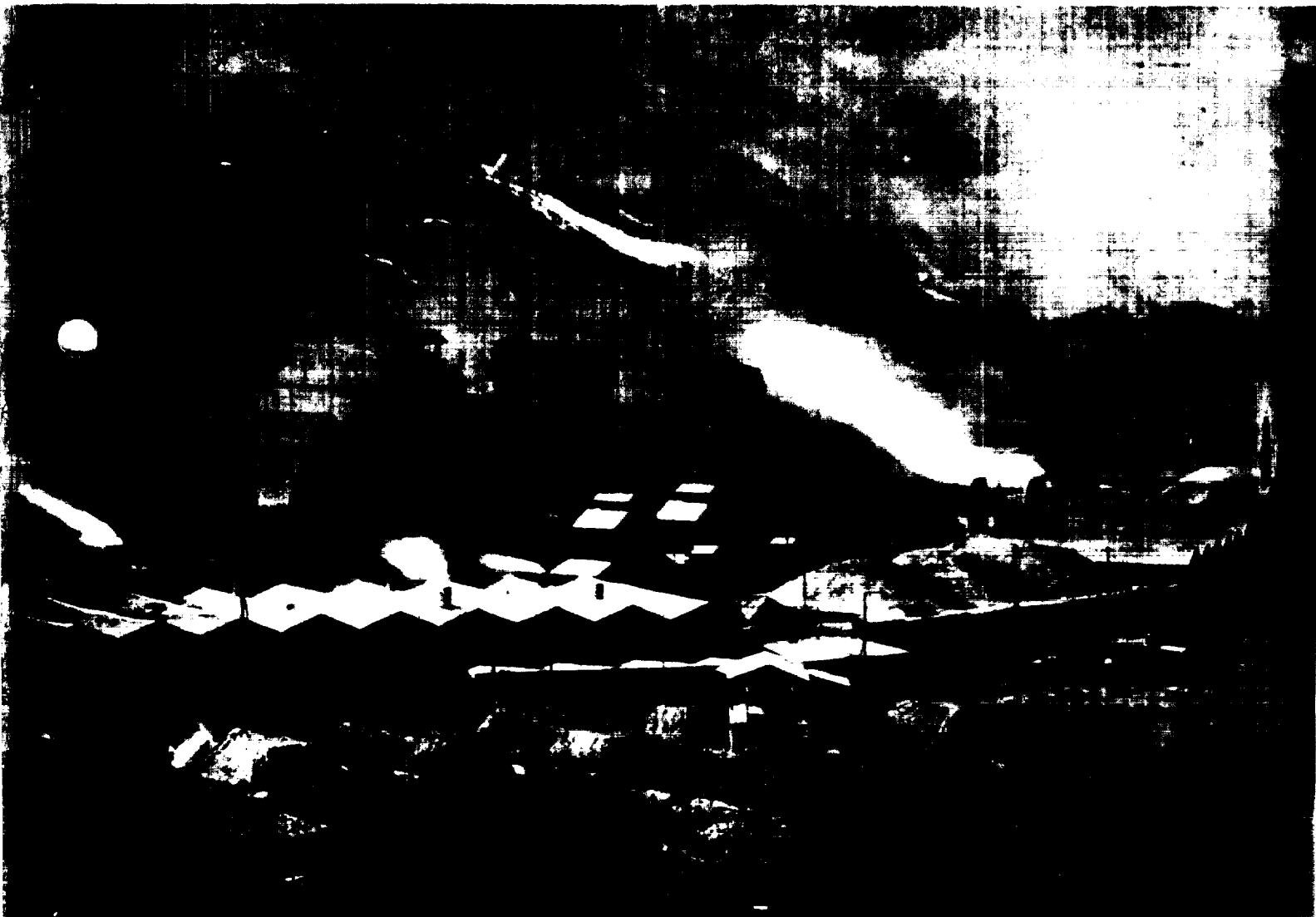
Montecatini has still more modernized and rationalized the organization in all its mines, both in Sicily and on the mainland. In many places the Company has installed electrical power, mechanized transportation and extracting, built special shafts which could stand the high speeds required by the very deep levels at which sulphur is found. By the end of 1935 its sulphur mines accounted for one third of Italian output; in 1943 they produced one half, thanks to continuous prospecting. To complete pro-

duction cycles. Montecatini also took over the Cesena and Bellisio refineries. Sulphur production, which had reached 120,000 tons per year before the war, decreased on account of war difficulties and owing also to the abandonment of work in the Grottacalda mine. In 1947-48, however, output has again increased.

Bauxite and minor minerals About 1935 the increasing development of the aluminium industry caused Montecatini to seek new sources of supply of bauxite, of which some deposits had been found in Istria. Prospecting, carried out by technicians in various territories, resulted in the discovery and exploitation of bauxite fields in the Puglie (S. Giovanni Rotondo) and other places.

The importance of this has become apparent specially after the war, as, owing to the loss of the Istria mines, the Puglie fields are today the only source of bauxite in Italy, capable not only of supplying home needs, but of alimentering a considerable export trade. In order to exploit the S. Giovanni Rotondo mines on an in-

ALUMINUM INDUSTRY - S. GIOVANNI ROTONDO



dustrial scale vast efforts were required. A special aqueduct, 8 kms long, was built, and in 1943 work was begun on a big cable way, capable of carrying 100 tons per hour, reaching from the mine to the port of Manfredonia.

In 1936 Montecatini took an interest in fluorspar, purchasing a number of mines from the Società Atesina per Esplorazioni Minerarie, and then developing the extraction of this mineral, which gives, through flotation, a product that is used in manufacturing cryolite, used in the aluminium industry. Fluorspar is also used in other industrial processes, such as iron mills, carbide works, enamel factories, etc. In 1939 Montecatini also bought from S.I.M.E.C. the Allumiere mines, from which a certain quantity of allumite was extracted; this is used to produce certain chemicals. The soda and hydrochloric acid industries, together with pyrites cinder chlorination, have always required large quantities of salt, which Montecatini got from Sicily and Sardinia. When in 1941 the transport shortage became acute, Montecatini started prospecting near Crotone and Rossano, in Calabria, where geological conditions were very similar to the Sicilian salt region, and an important deposit of rock-salt was found.

Lignite Montecatini began to take an interest in lignite during the first world war, but of the various activities then started only the Ribolla mine remained producing. Lignite output, which was very limited in the post-war period, was increased in 1935 owing to the industrial rehabilitation program covering the entire territory, following which this lignite-field became the most important on the Italian mainland.

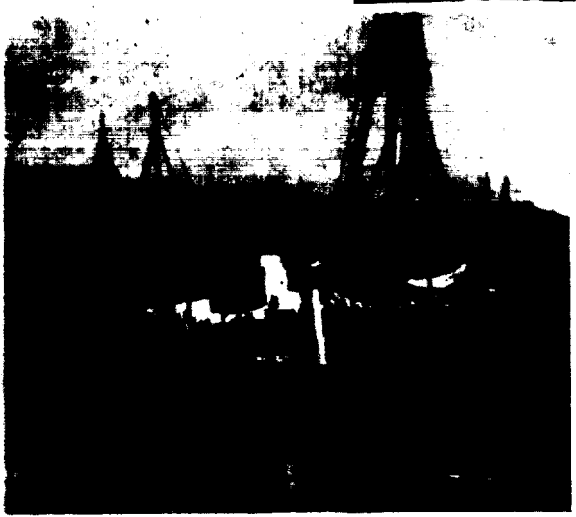
During the recent war Ribolla became a great mine, equipped with the most up-to-date machinery for extracting, transporting and processing lignite. Production reached a maximum of 280,000 tons per year in 1942; at present it shows a tendency to decrease, owing to resumption of normal fuel imports. Montecatini is however studying a way to use this fuel for certain chemical processes.

Marble Marble exports were once one of the most notable items in the Italian commercial balance.

Montecatini began to take an interest in marble production in 1922, purchasing a number of concessions in the Apuan part of Garfagnana.

The marble quarries taken over by Montecatini covered in 1935 a total area of 4,500 square meters, i. e. about 45% of the total Carrara marble-producing area, with an optimum output of 100,000 tons per year. Montecatini, through its affiliated

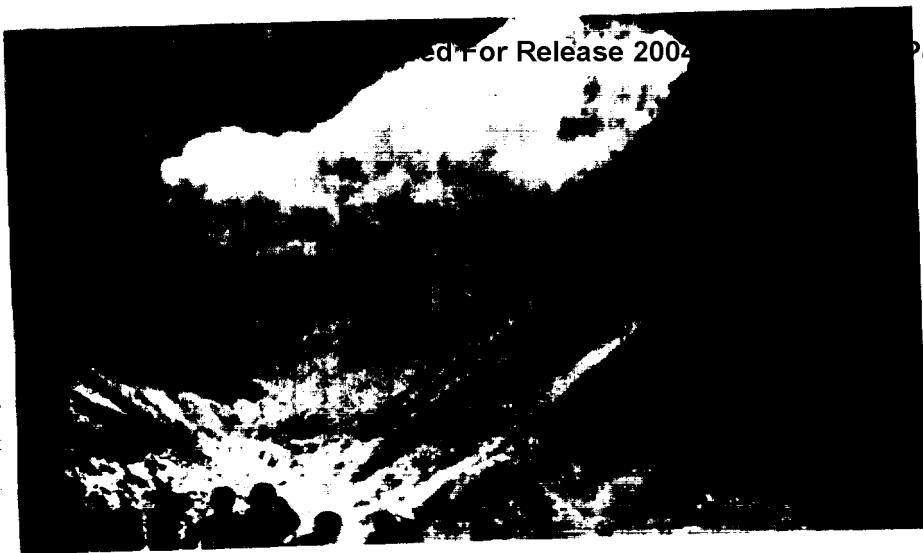
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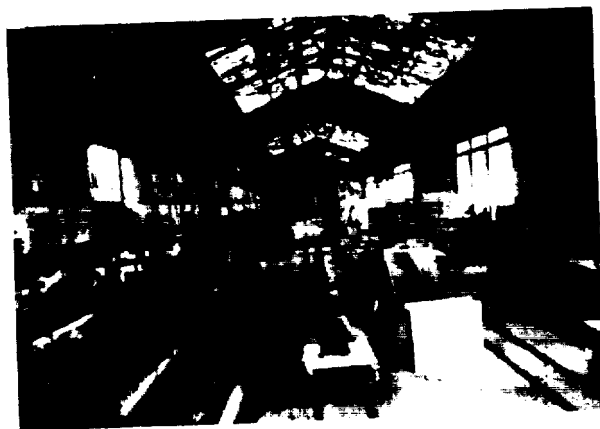
CARRARA
(Montecatini Co.)
Marble Quarries
and Loading Wharf



Companies, worked altogether 150 quarries and 12 saw mills and workshops. A vast plan of technical and commercial organization (both at home and abroad) was put at once in operation; the big quarries were equipped with modern machinery, wastes were reduced and utilized, care was taken to standardize types of production and rationalize excavations. At the same time other quarries and saw mills were pur-



CARRARA
Marble Quarries
View of the Carrara
Marble Quarries



VIAREGGIO
Montecatini Co.
Marble Workshop



PIETRASANTA
Montecatini Co.
Working on the Portal of a Church



CARRARA-AVENZA
Montecatini Co.
Storehouse for Marble Slabs

chased, both in Apuania and in other Italian regions. Montecatini extended its interest to other types of marble, besides Carrara white: travertine, colored marbles, granite. As a result of all these activities Montecatini's marble production, which in 1935 had been 3% of national output, became 13% in 1942. Exports advanced proportionally, from 8% to 21% of the Italian total. Today, after the temporary contraction due to the war, production is again developing favorably.

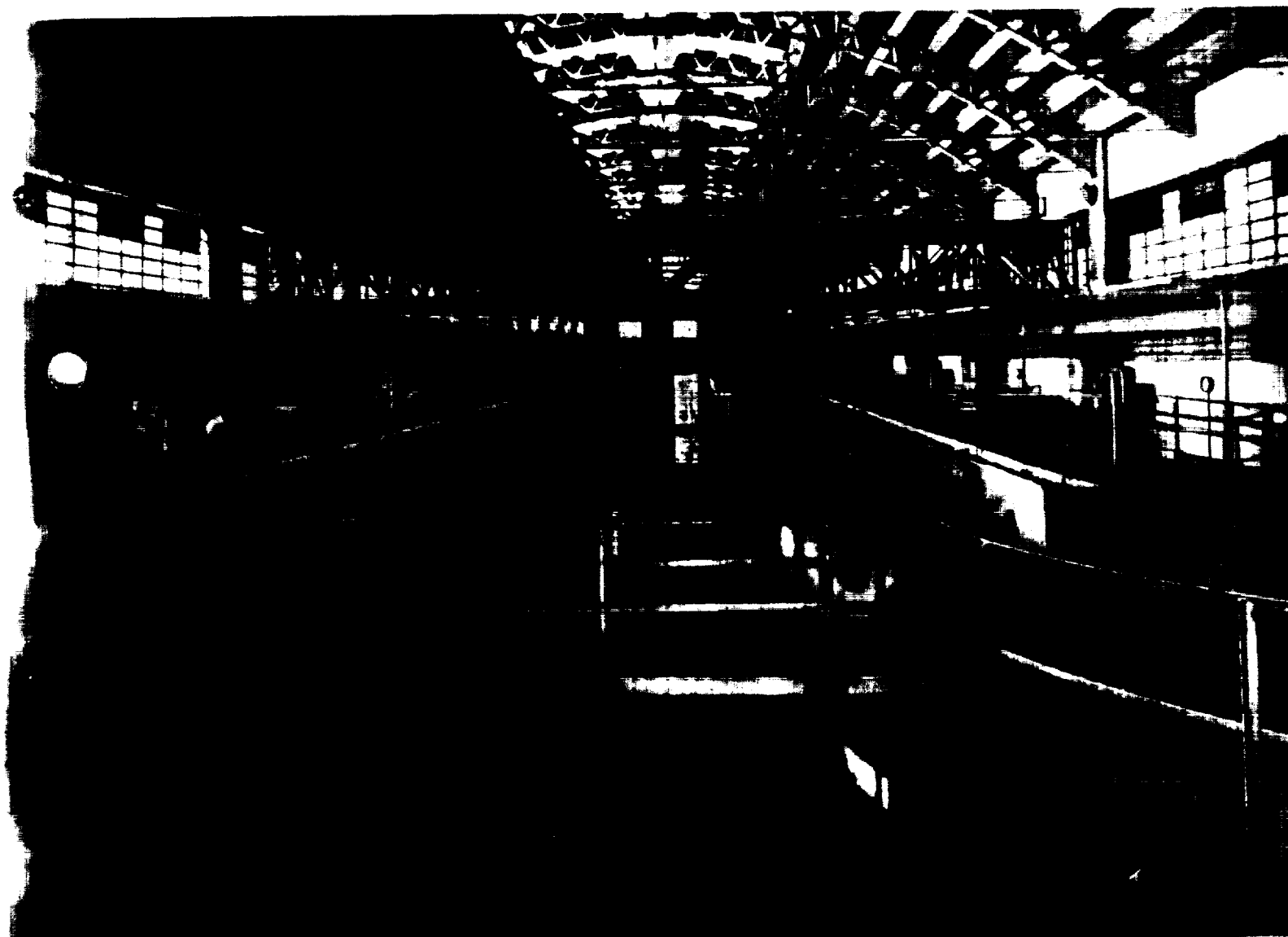
METALLURGY

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Aluminium In 1918 the aluminium industry was represented in Italy by two small plants in all, both belonging to foreign firms. The scarcity of copper and the possibility of substituting it with aluminium in many uses, led Montecatini to take an active interest in the matter. Having studied and solved the preliminary problems, the stage of practical realization was reached by setting up an affiliated Company, I.N.A. (Industria Nazionale Alluminio). In 1935 Italian aluminium production had gone up considerably, thanks principally to Montecatini. The next year a wider production program was planned, providing for direct access to the necessary

FORTO MARGHERA

I.N.A. Co. Factory for the Production of Alumina



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raw materials, chief among which alumina, and for a notable increase in the quantity of metal which could be obtained from those raw materials. A more up-to-date alumina plant was built at Marghera, and new aluminium works were started at Bolzano, to be run by means of the vast net of hydroelectrical power supply in process of construction in Alto Adige (Upper Adige). The Bolzano works started producing



MORE

EN A Co. Factory for the
Production of Aluminum

PORTO MARGHERA

ALUMINUM

Factory for the Working of Light A





BOLZANO (I.N.A.) - Factory for the Production of Aluminium

in 1937, and were later expanded, as also was the Mori plant, which already existed. This expansion in production affected not only the quantity of the products, but their quality as well, and particularly the processing technique. The great increase in production required an adequate supply of electrical power, which was assured by means of the new stations built at Ponte Gardena and Bressanone, capable of supplying the I.N.A. works with 400 million kWh per year altogether.

Besides metal, production was also developed in the field of alloys and their uses, in the form of milled, rolled, drawn and section metal, etc. These lines were chiefly developed by the affiliated Company, "Lavorazione Leghe Leggere", which built two modern plants at Porto Marghera and Ferrara.

Montecatini also took an interest in the production of finished aluminium products, setting up another affiliated Company, Metallurgica Nazionale F. A. C., which has plants in a number of Italian towns. In this field also production went down to a few thousand tons per year at the end of the war; post-war recovery was handicapped by shortages of raw materials, transport difficulties, and lack of fuel and electrical power. Production however has now considerably increased, as well as sales, which, as far as crude and semi-manufactured metals are concerned, are effected through



another affiliated Company, A.S.A. (Alluminio Società Anonima), which was set up in agreement with the Swiss A.I.A.G. Combine for the sale of primary and semi-manufactured aluminium. Sales of secondary aluminium are directly effected by Metallurgica Nazionale F.A.C.

Lead and zinc Montecatini, which had taken an interest in the lead and zinc sectors as far back as 1910, in 1933 took decisive steps in exploiting the lead deposits in Sardinia and, by invitation of the State, took over and bought, in equal administration with the Società di Monteponi, mines which had formerly belonged to the Società Mineraria di Montevecchio. The foundry at S. Gavino Monreale remained with the Società del Piombo e dello Zinco then in existence, which was later absorbed by the Montevecchio Company. The situation was far from satisfactory; the machinery, facilities and ore-beds themselves in the newly-bought mines were in a critical condition, and a radically new program of mine exploitation had to be organized, as well as a new system of processing lead and zinc ores (galena and blende). Thus plants for selective flotation were installed in the mines, while large works were built at Marghera for the production of zinc through electrolysis. Before the war Montevecchio produced 20,000 tons per year of lead, and 14,000 tons of zinc; when the war started, production was taken over and controlled by the Government. Only in 1946 activity became free again, and mines and works were further expanded.

CHEMICAL INDUSTRY

Phosphatic fertilizers In the first years after the first world war the position of the Italian fertilizer industry was absolutely irrational; no co-ordination had been arranged between centers of raw material supplies and consumption areas. From 1917 to 1920 Montecatini took over the most important companies then existing in this field, both in Northern and Southern Italy; the southern factories were doubled, phosphate rock working processes perfected, and foreign supplies were normalized by means of a rational transport organization. In the twenty years between the two world wars, in order to reduce production costs, Montecatini, by building new large works and by reorganizing those already in existence, concentrated production in big modern plants, eliminating out-dated ones. A notable and varied technical progress accompanied industrial expansion. Pre-war production had reached over 1,000,000 tons per year; in 1945 it had practically gone down to zero owing to the lack of phosphate rock supplies; in 1947-48 however it has greatly increased, reaching a considerable figure.

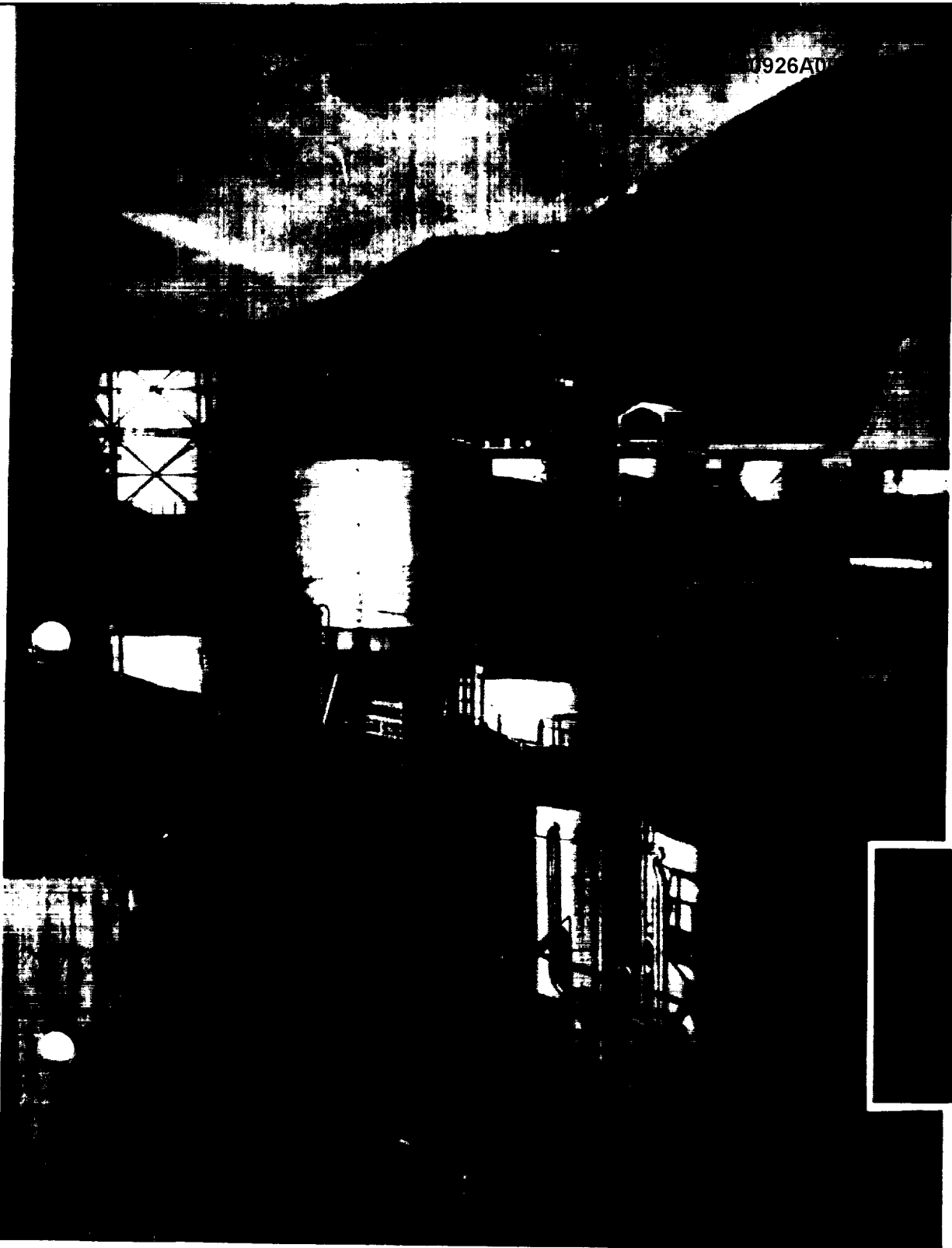
Copper sulphate, anticryptogams and insecticides Before the recent war Italy was the largest producer of copper sulphate in the world. Montecatini took an interest in this field at the same time in which it entered the phosphatic fertilizers sector. Plants were taken over at Vicenza, Rifredi and Bagnoli; new ones were added at Legnago, Piano d'Orta, Vercelli, Spinetta Marengo, Brindisi. All these factories were made wholly up-to-date both in production technique and plant organization, and capacity was gradually increased until it covered consumption needs. In 1935 the capacity of the copper sulphate works had reached 80% of potential Italian production.

Besides copper sulphate, Montecatini took an interest in the production of ventilated sulphur, silicon fluorides, and other products, chiefly in the arseniate sector.

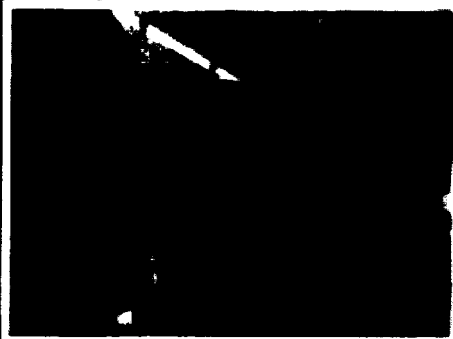
After the war all these productions have been actively resumed; to improve the quality of anticryptogams and insecticides a special research laboratory has been established at Carmignano-Signa.

Particular mention must be made of the production of pure DDT and of the various products for agricultural uses, for which Montecatini is the sole concessionaire in Italy of the Geigy Company, Basel.

In 1948 a new affiliated Company was set up under the style of Timor Italiana for the production and sale of Timor insecticide against domestic insects. Timor is sold in containers supplied with aerosol sprayers.



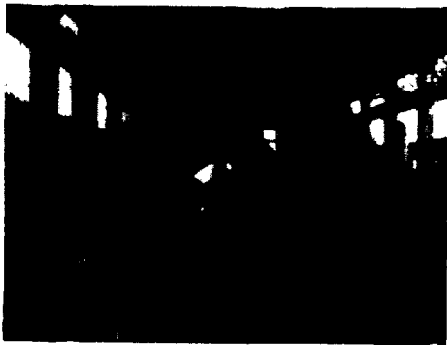
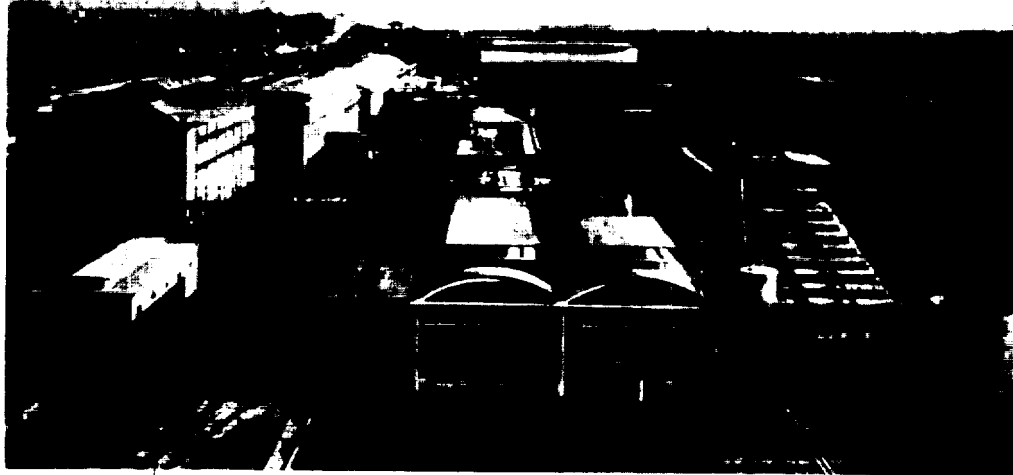
MERANO
(Montecatini Co.)
Factory for
Nitrogenous Products



SAN GIUSEPPE DI CAIRO
(Montecatini Co.)
Factory for
Nitrogenous Products

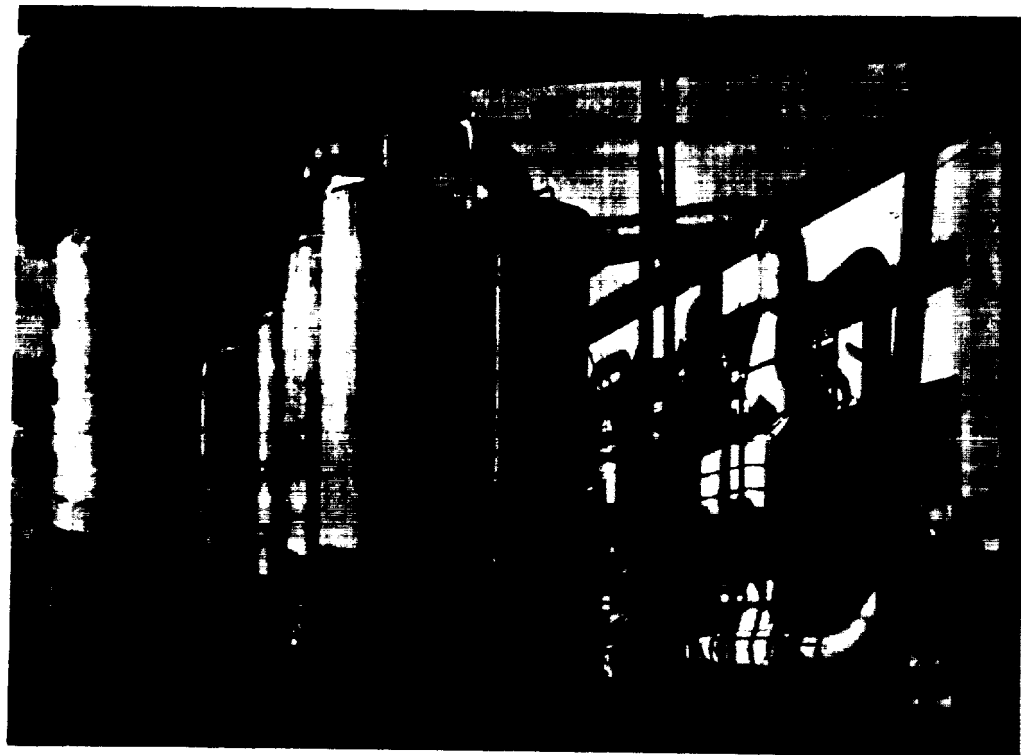
Nitrogenous fertilizers In 1921 Giacomo Fauser, an engineer, succeeded, after long studies and overcoming great difficulties, in effecting on an experimental scale the synthesis of ammonia, producing hydrogen from water by means of electrolysis. Montecatini immediately realized the great possibilities this new method could open for the future and at once started building a plant at Novara, where the Fauser

APUANIA
(Montecatini Co.)
Factory for
Nitrogenous Products



SAN GIUSEPPE DI CAIRO
(Montecatini Co.)
Factory for
Nitrogenous Products

SAN GIUSEPPE DI CAIRO
(Montecatini Co.)
Factory for
Nitrogenous Products



patents could be exploited on an industrial scale. Excellent results were obtained, and in later years other plants were built for the production of synthetic ammonia the first being at Crotone, Merano, and Bussi. When further technical progress showed the advisability of producing synthetic ammonia from coke oven gas instead of water electrolysis, Montecatini immediately turned to this new method, building

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new works at S. Giuseppe di Cairo and Apuania, which are the most important in Italy, and among the most modern in Europe.

Montecatini production of synthetic nitrogen, which amounted to 100,000 tons per year before the war, diminished considerably in 1945. But in 1947 a satisfactory increase has been reached, and this has continued in 1948, when production has exceeded pre-war levels. Montecatini produces about 70 % of the Italian nitrogen output.

Fausser-Montecatini patents have been largely adopted abroad; 44 plants in 16 countries produce nitrogen derivatives by means of these patents.

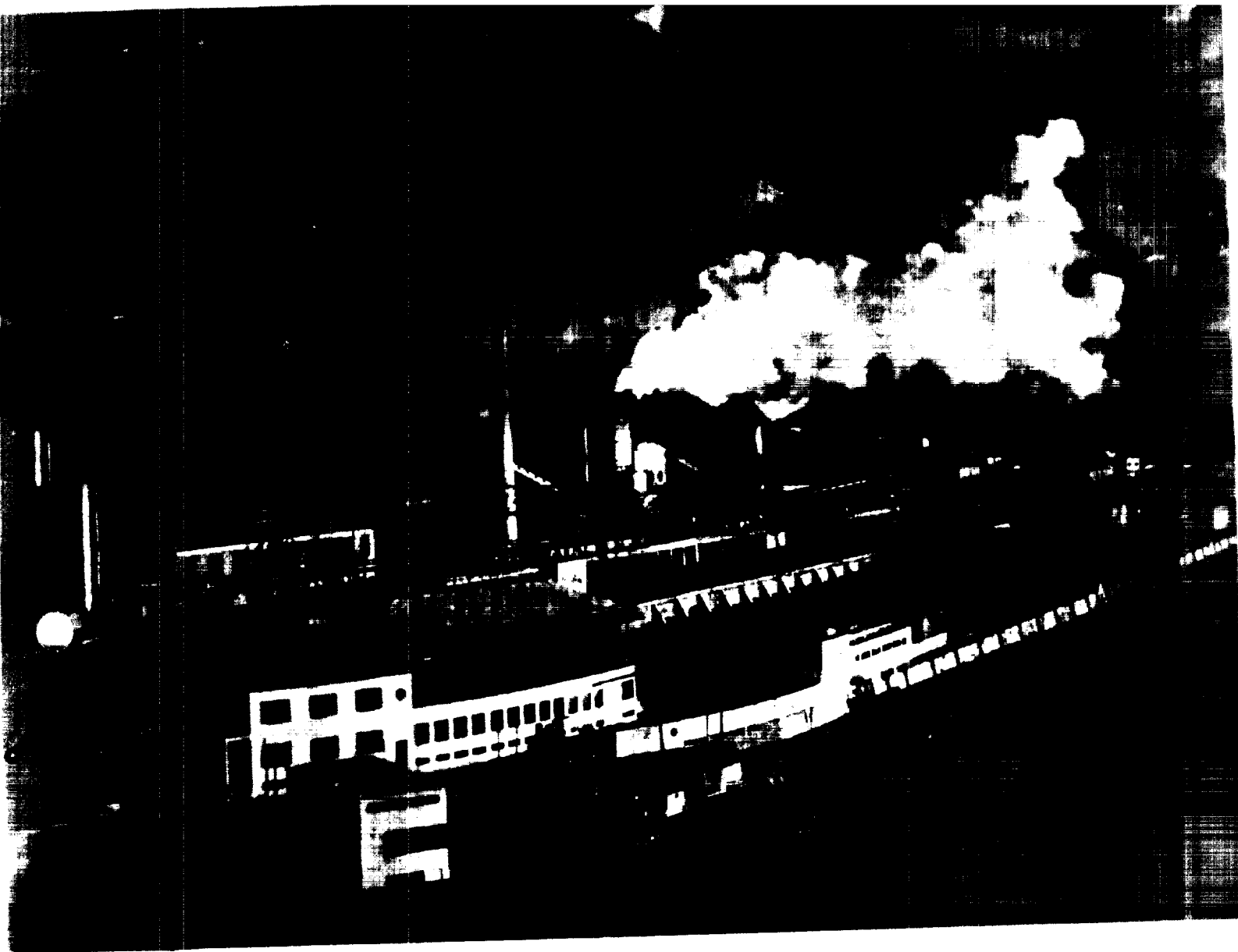
Coal derivatives

The need of large quantities of hydrogen for the synthesis of ammonia made it necessary to build coke oven plants, which would produce the basic raw materials required and, at the same time, allow a total utilization of secondary products.

Therefore an agreement was at first reached with the Società Italiana del Gas, following on which, in 1935, the Società Cokitalia was set up. This company started at once building a large coke oven plant at S. Giuseppe di Cairo, which was connected with the local ammonia works by means of two pipe-lines, one to convey coal gas to the de-hydrogenation plants, the other to take de-hydrogenated gas back to the coke oven plant for thermal uses. These works cover an area of about 200,000 sq. meters, and comprise: facilities for transporting, blending and preparing coal; batteries of furnaces for coal distillation; machinery and apparatus for processing gas and extract-

APIUANIA (Cokapuania Co.) Coke Oven Plant





SAN GIUSEPPE DE CAIRO. COKE OVEN PLANT.

ing various by-products, such as benzol, tar, ammonium sulphate; facilities for transporting, treating and gauging coke; distilling apparatus for benzol and tar, in order to obtain pure and commercial products; laboratories for analyses and tests, maintenance workshops, thermal and chemical power stations, etc., and built according to the safest and most perfect systems and methods that modern distilling technique could suggest.

In 1939, with the participation of the Italian company, another plant was set up, under the style of Cokapuanza, and a new coke oven plant, similar to the one at San Giuseppe de Cairo, was built at Apuanza, and also connected with the local transportation works.

Production in both coke oven plants has been resumed for some time, and has reached a level which will certainly be exceeded this year, even though they are equal to the pre-war output.

Calcium carbide and cyanamide Montecatini entered this field in 1922. At that time one of the biggest factories produced, in the Domodossola works, 7% of the total Italian carbide output, and 15% of calcium cyanamide. Two years later, after Montecatini had started work on it and had set up the Società Elettrochimica del Toce with its expanded Villadossola works, the production represented about 25% of total Italian output. Today Montecatini owns plants at Domodossola, S. Marcello, Apuania (the Apuania works have been but recently built), and at Villadossola (through the affiliated Società Elettrochimica del Toce). Since carbide became a basic raw material for other important lines of organic products, its production was considerably increased, while cyanamide output was kept to a more limited level.

DOMODOSSOLA - Montecatini Co.
Calcium Carbide and Cyanamide Factory



APUANIA - Montecatini Co.
Calcium Carbide and Cyanamide Factory



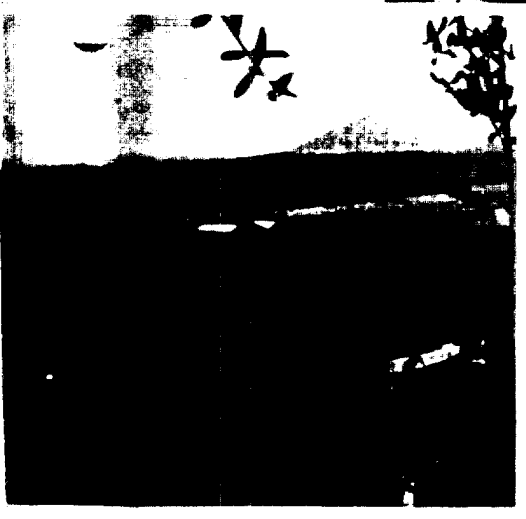
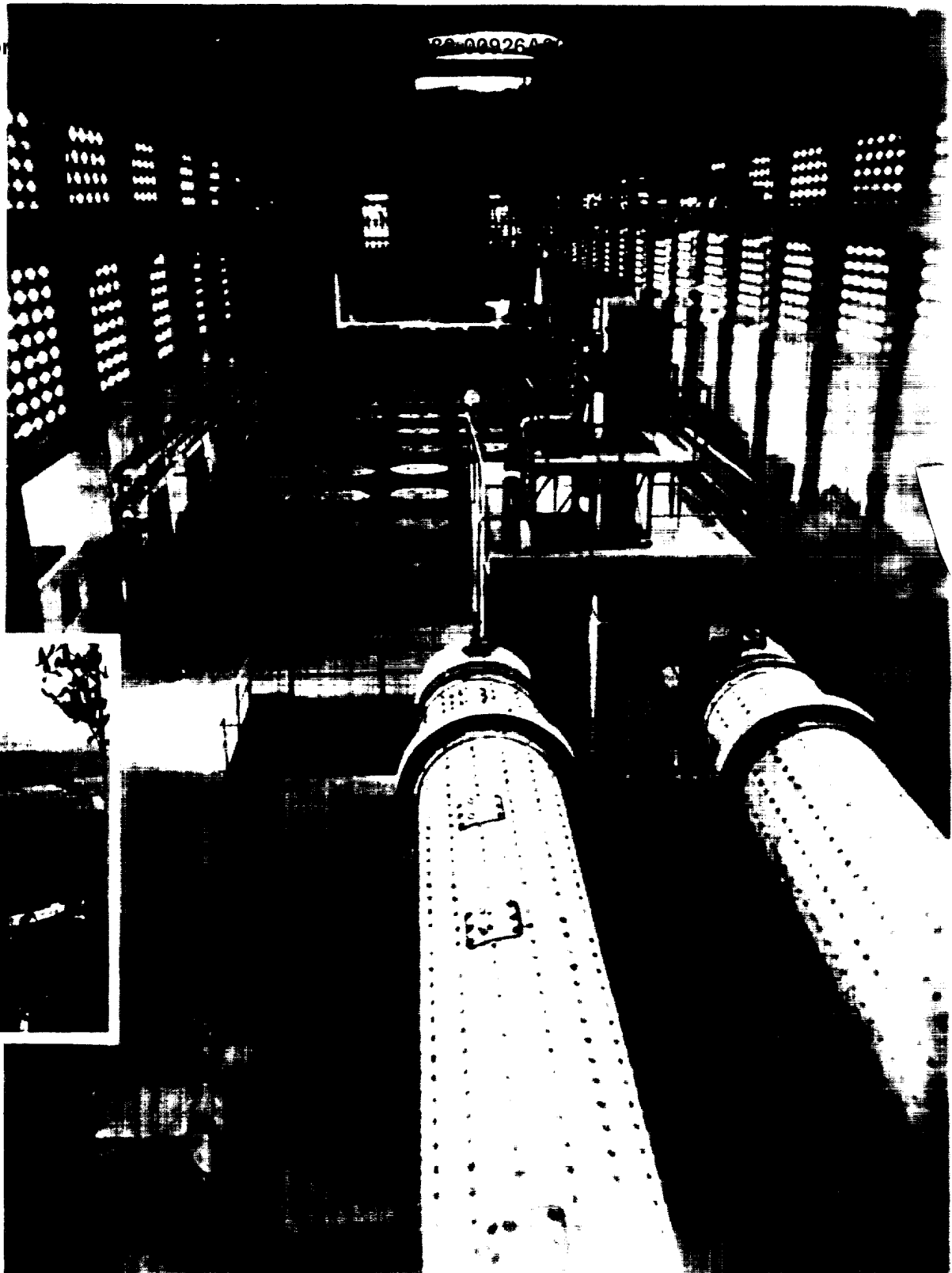
Caustic soda and chlorine The soda and chlorine industry is one of the three main branches of the so-called heavy chemical industry, the other branches being the sulphuric acid and nitrogen industries. Montecatini took an interest in this field in 1931, when it started on the difficult job of reorganizing the A.C.N.A. Company; this resulted in the Montecatini acquiring the three important caustic soda and chlorine plants at Bussi, Cesano Maderno, and Cengio.

These plants were rehabilitated not only by increasing production, but also greatly improving technical processes as well. In the years of highest output, caustic soda and chlorine production reached 25,000 tons per year, equal to about one-third of total Italian output.

APLANIA

(Montecatini, Co.)

Inside View of the Calcium
Carbide and Cyanamide Factory

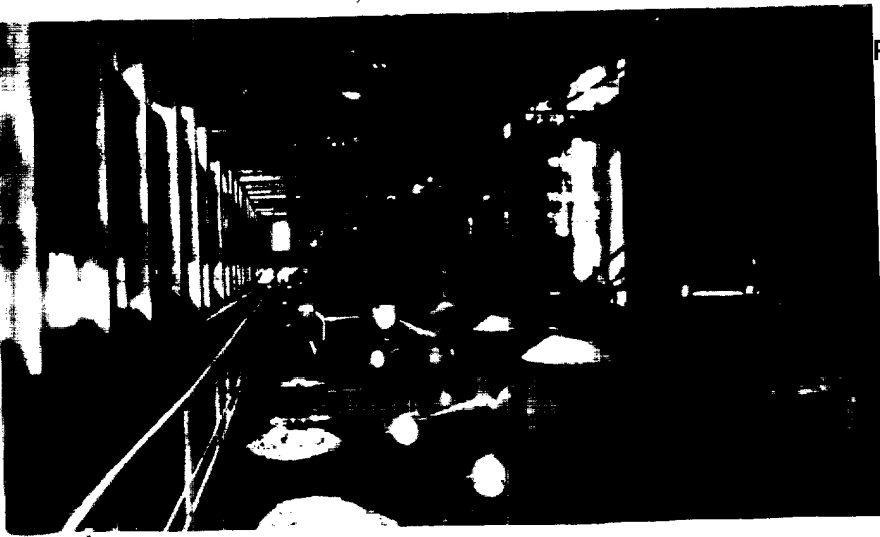


Chemical products for industry | Montecatini entered the field of chemical production for industry after 1930. During this period, which, we may judge, seals the process of development of the Company, the numerous possibilities till then acquired were put to use. In fact, chemical products for industry, while they

SPINETTA MARENGO
(Montecatini Co.)
Particular of the
Synthetic Camphor Plant



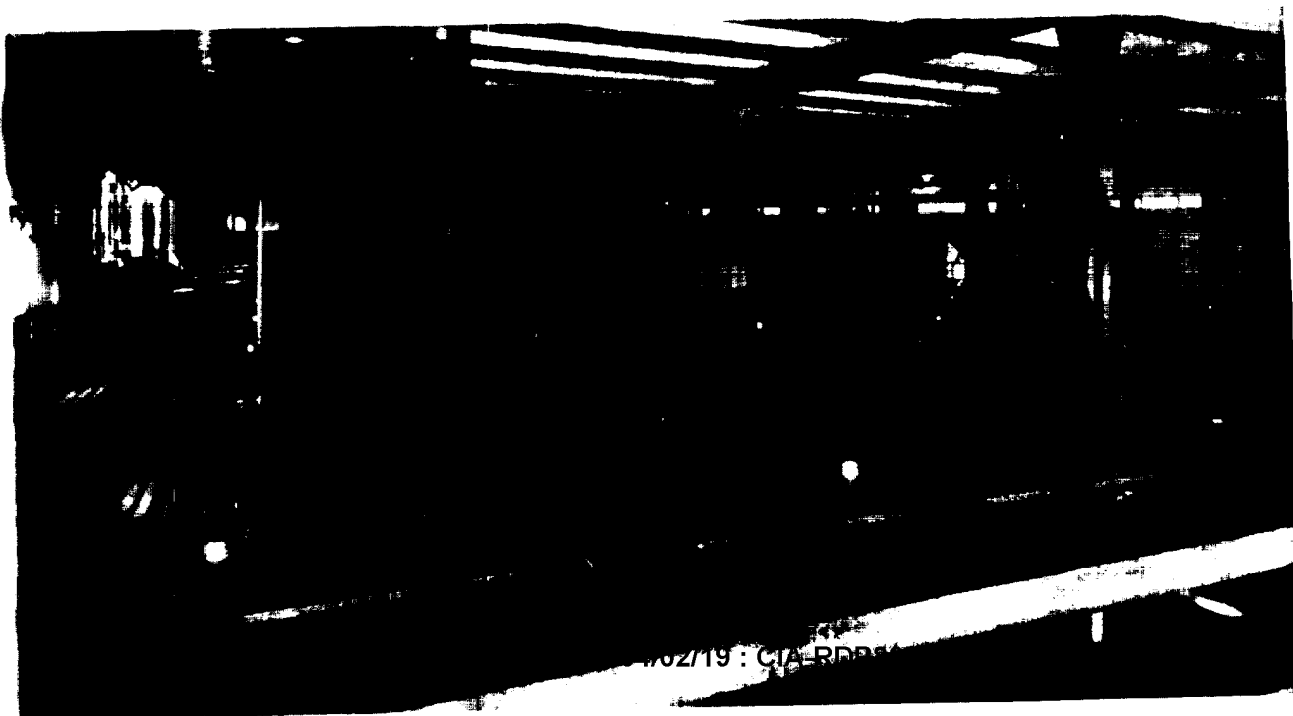
MILANO-BRUZZANO (Montecatini Co.)
Particular of the Carbon Disulphide Plant



amount to a very large number, are centered on a few basic products: chiefly the three acids, that is, sulphuric, nitric, and hydrochloric, which Montecatini had become able to produce on a large scale through the pyrite and synthetic nitrogen industries.

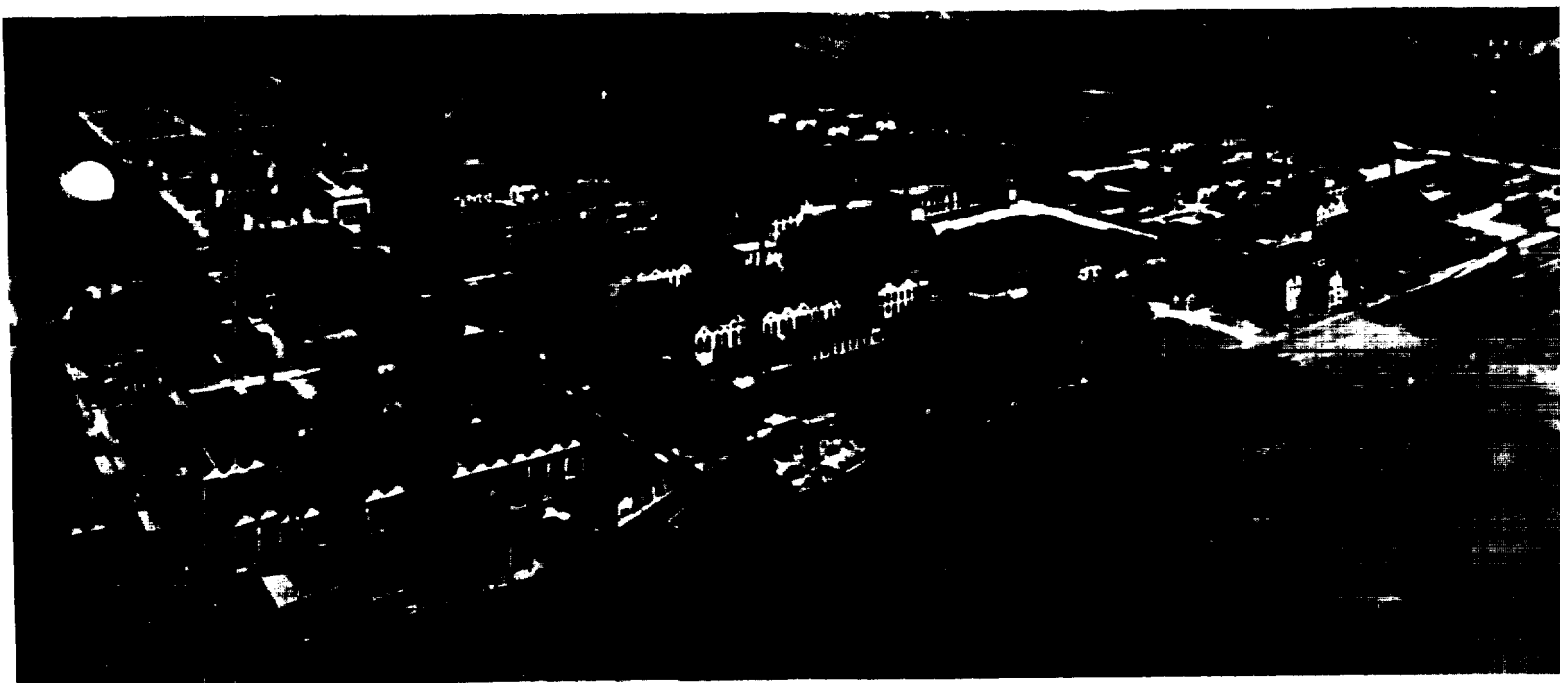
In this field Montecatini is producing hundreds of products, which are used practically in every Italian industry: we may mention among the rest: hydrogen peroxide and persalts, sulphites and hydrosulphites, magnesium salts, sodium sulphate, potassium salts, aluminium sulphate, chromium salts, silicates, activated carbon, etc. As the production of sulphuric acid is generally considered as a norm to evaluate the total activity of a chemical concern, we may well add that in 1948 the production of this acid reached about 700,000 tons, equal to 85% of pre-war output. This was possible thanks to the intense reconstruction work on the plants and to the gradual improvement of the supply of the raw materials, namely, pyrite.

BUSSI
(Nobel Co.)
Particular of the
Sodium-Chlorine Plant



Dyestuffs and intermediates In 1931 the Aziende Chimiche Nazionali Associate, which owned the chief Italian dyestuff factories then working, came to be in a critical position owing to several reasons, chief among which the agreement among Swiss, French and German producers.

Montecatini decisively entered this field, setting up a new Company, under the style of Aziende Colori Nazionali Affini, A.C.N.A., which progressed safely and constantly. From 1931 to 1935 the dyestuffs plants at Cengio and Cesano Maderno were reorganized, production was gradually brought to meet the needs of the market and research work was extended. To this end, over and above the laboratories already in existence,



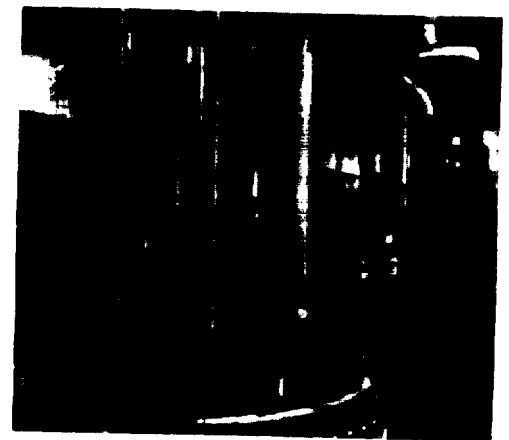
CESANO MADERNO (A.C.N.A. Co.) Synthetic Dyestuffs Factory

a great research institute for organic chemistry was built in 1934 at Cesano Maderno and endowed with up-to-date research facilities. Thanks to the studies carried out there, the range of dyestuffs and intermediate products has been extended, especially in the field of high solidity dyestuffs, such as the Romantrene, Solindene, Eliamina Lacr., and Alizarina series, etc.; moreover, it was possible to produce other organic products of great importance in several fields, such as vulcanization accelerators, rubber anti agers, etc.

Considerable progress was also made in the commercial field where most foreign dyestuffs were supplanted and Italian exports assured.



CENGIO A.C.N.A. Co. Synthetic Dyestuff Factory



CESANO MADERNO A.C.N.A. Co.
Synthetic Dyestuff Factory Particular of Plant



The war caused A.C.N.A. to greatly reduce its production, owing to cessation of exports and the limited home consumption of dyestuffs due to the lack of raw materials. Today however the situation is rapidly improving and in 1948 dyestuffs production nearly reached pre-war level thus making it possible to meet home needs and to resume exporting.

Pharmaceutical products Many intermediate products developed in the dyestuffs industry find a use also in pharmaceutical production. Early in 1945 therefore Montecatini took over the Settimo Torinese plant from the Società Siderurgici Chimici (S.S.C.) of Pinerolo (Torino) and transferred it to the Pirelli-Schiapparelli, Torino; then an agreement was reached

the derivatives of salicylic acid and pyrazolone. Anesthetics and hypnotics with the derivatives of p-aminobenzoic acid and the barbiturics. Products for diagnostics and vitamins. Hormones, vaccines, alkaloids, and a long series of organic and inorganic compounds, from hexamethylenetetramine and its derivatives to phenolphthalein and piperazine; from glycerophosphates to benzonaphthol, etc. The whole vast range of mercury, iron, bismuth, iodine and lithium salts, etc.

These products represent some of the main technical branches and lines of Farmitalia which, having got over the wartime paralysis due to shortages of raw materials and having modernized its machinery and processes, has already raised production and sales to a satisfactory level. A special impulse has been given to scientific research with the establishment of a research laboratory in Milano.



MILANO (Farmitalia Co.)
Laboratory for
Biological Testing

Glues and gelatins The glue and gelatin industry is one of the oldest in Italy in the chemical field. The first plant was built in Torino in 1858. In 1935 as many as 118 plants were producing in Italy; but production was hampered by the scattered condition of the factories and by the out-dated, empirical technique which was being used. Then Montecatini came in, at first taking a financial interest in one of the

TORINO
(Montecatini Co.)
Factory for Glues and Gelatins

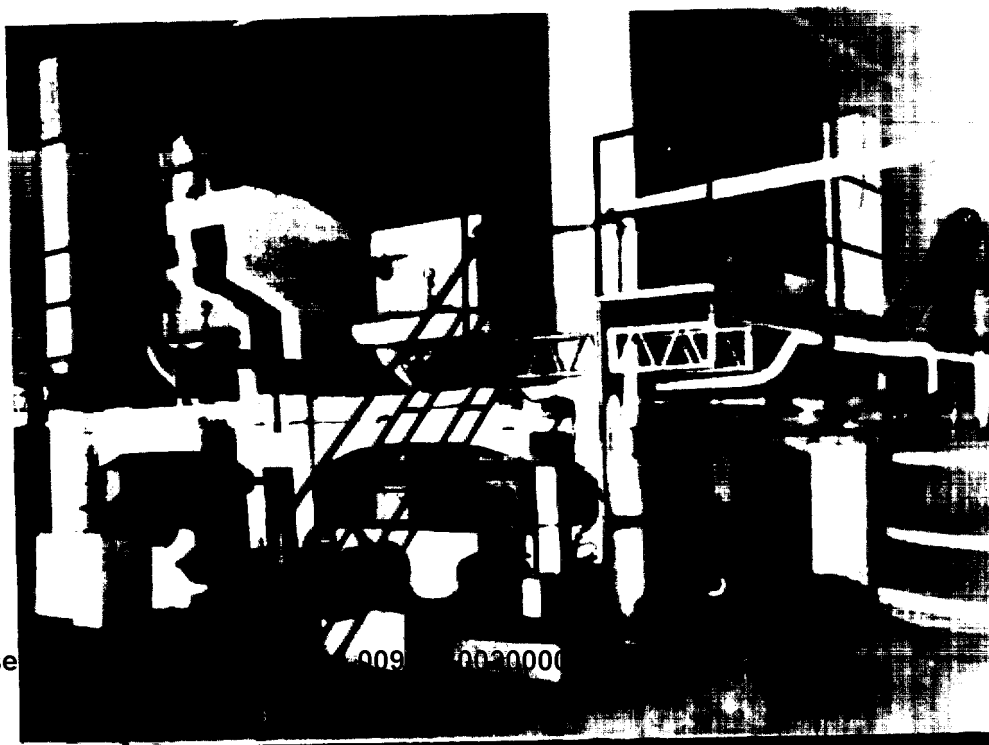


biggest firms, the Società Anonima Fabbriche Riunite Agricoltori Italiani, then, in 1931, taking directly over the ownership and management of the factories of the Company. In 1935 production of the factories of the Concern had been brought up to date, and covered four fifths of total Italian output of bone glue.

In 1936 Montecatini started producing edible gelatins and in 1937 skin gelatins were also produced. Good results were also obtained in utilizing by-products.

In this field too the recent war caused a serious slump, but after the war there was a satisfactory progress and in 1948 the production of technical and edible gelatins exceeded by 90%, on an average, the 1946 output.

TORINO
(Montecatini Co.)
Factory for Glues and Gelatins



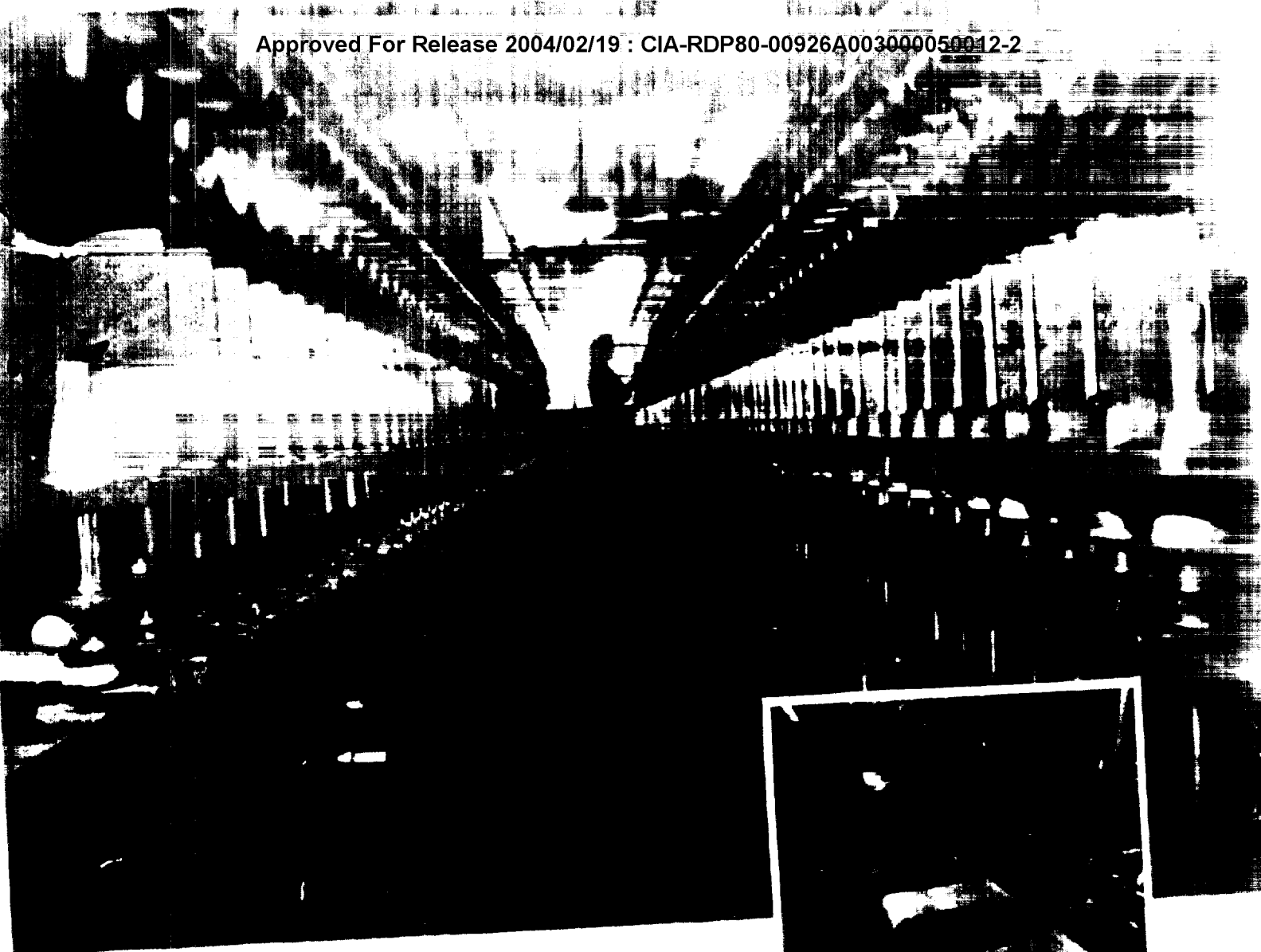
3

Explosives Montecatini entered this field in 1922, taking an interest in the Società Consumatori Esplosivi which was then set up; this Company built a dynamite factory at Orbetello, and after further developments changed its style to Società Generale di Esplosivi e Munizioni. In 1925, having largely expanded the production of the acids required for the explosive industry, Montecatini reached an agreement with the Societe Centrale de Dynamite, Paris, by which it got control of Dynamite Nobel, a Company which at that time had been working for over 50 years already, and which enjoyed a reputation as high as any other firm in the world in the field of both bursting and propelling explosives.

Gradually, owing to the increasing production of mineral acids and the support of the French Nobel Company, Montecatini came to have absolute control over the Italian Nobel, whose technical organization soon became as perfect as the French and English Companies'. In 1942 the two Companies (Dynamite Nobel and Società Generale di Esplosivi e Munizioni) were merged, under the style of Nobel - Società Generale di Esplosivi e Munizioni. This affiliated firm had, after the war, the most difficult task in reconverting its plants for peace production; therefore, while reconversion was still proceeding (as it still is), production has been successfully resumed and expanded in the field of industrial explosives and such materials (gelatins, dynamite, shooting powder, safety fuses for miners, ordinary detonators and electrical primers), as well as some basic products for the chemical industry.

Fig. 1. Nobel Explosives Factory





PALLANZA Electrochimica del Loro (Co)
Plant for the Manufacturing of Nylon Yarn



PALLANZA
(Electrochimica del Loro (Co))
Plant for the Manufacturing
of Nylon Hose

Rayon and Nylon Until 1928 Italian interest in the field of artificial textile materials was concentrated on the most common type, i. e. viscose rayon. Then onward Montecatini started producing the better types of acetate rayon, supported by the thought that its large production of calcium carbide assured an unfailing supply of the necessary raw materials. Again chemical chain production opened up new possibilities.

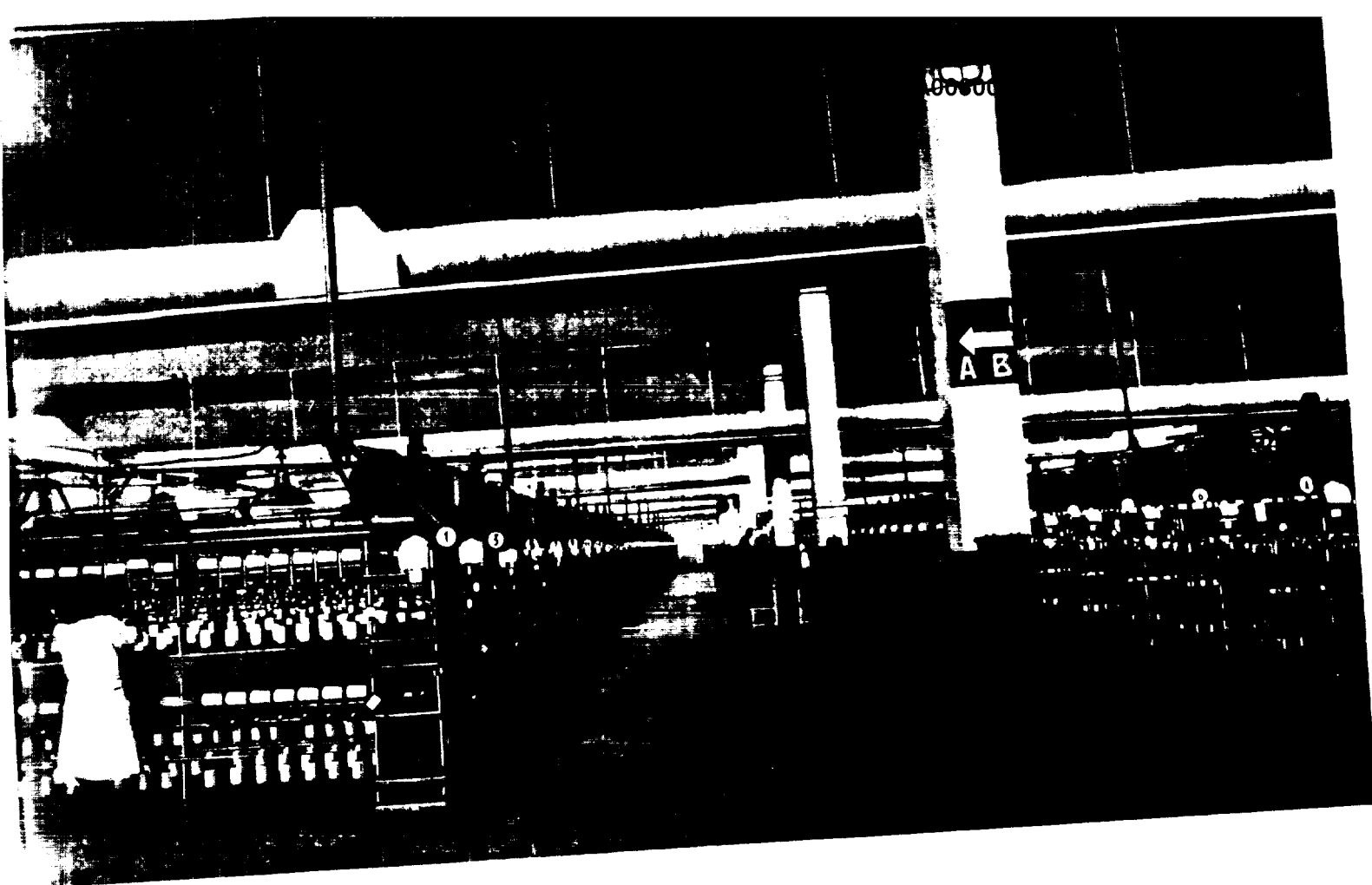


Fig. 1. S. Z. A. - Rhodioceta Italiana - Acetate Rayon

An agreement was reached with the French Group, Comptoir des Textiles Artificiels et Usines Rhone Poulenc, and the Società Rhodioceta Italiana was set up: this Company immediately started building a vast factory at Verbania-Pallanza for the production of acetate rayon. In 1936 installations were expanded while in 1942 a new plant was built in order to produce acetone, starting from recovered diluted acetic acid. Every effort was made at Verbania to keep up production all through the war: in this way post-war recovery was made easier, and today production of acetate rayon is almost back to pre-war level.

Montecatini and Rhodioceta, together with Rhône Poulenc, have also taken an interest in another Company, i. e. Società Elettrochimica del Toce, whose activity also covers the field of synthetic textile yarns. This Company owns a factory at Villadossola where the production of calcium carbide has been lately expanded to comprise new products required by the acetate rayon works at Pallanza. When in 1939 Montecatini approached Du Pont de Nemours in order to take over the Italian rights on nylon patents, new plants were set up at Novara and Pallanza, and today Società Elettrochimica del Toce is the only Italian producer of this new and wholly synthetic material and the sole supplier to all industries which make use of it.

Paints and pigments

Montecatini, together with the associated Nobel Company and by agreement with the American Group, Du Pont de Nemours, set up, on February 16th, 1928, the Società Duco (later merged with Montecatini) for the production of cellulose esters varnishes. This act marked the beginning of a new, important activity, which was later expanded and intensified until 1942, when war interrupted all relation with the American firm and severely cut down production. Besides varnishes and enamels, pigments were also successfully produced by Montecatini, which turned great plants over to this work.

Among pigments titanium dioxide is especially worth considering as it is finding more and more uses in the varnish and textile industries. Litopone is another important pigment; Montecatini turned to it in 1934, and set up at once the Società Italiana del Litopone with a factory at Livorno.

In 1943, when it was producing as much as 10,000 tons per year, the Livorno factory had to stop owing to the war. As it underwent almost total destruction, reconstruction work on the factory was long and difficult; in 1947 however this work had been completed, and production had been resumed, and was progressing favorably. Production of Duco varnishes also went up in 1948 to about pre-war level.



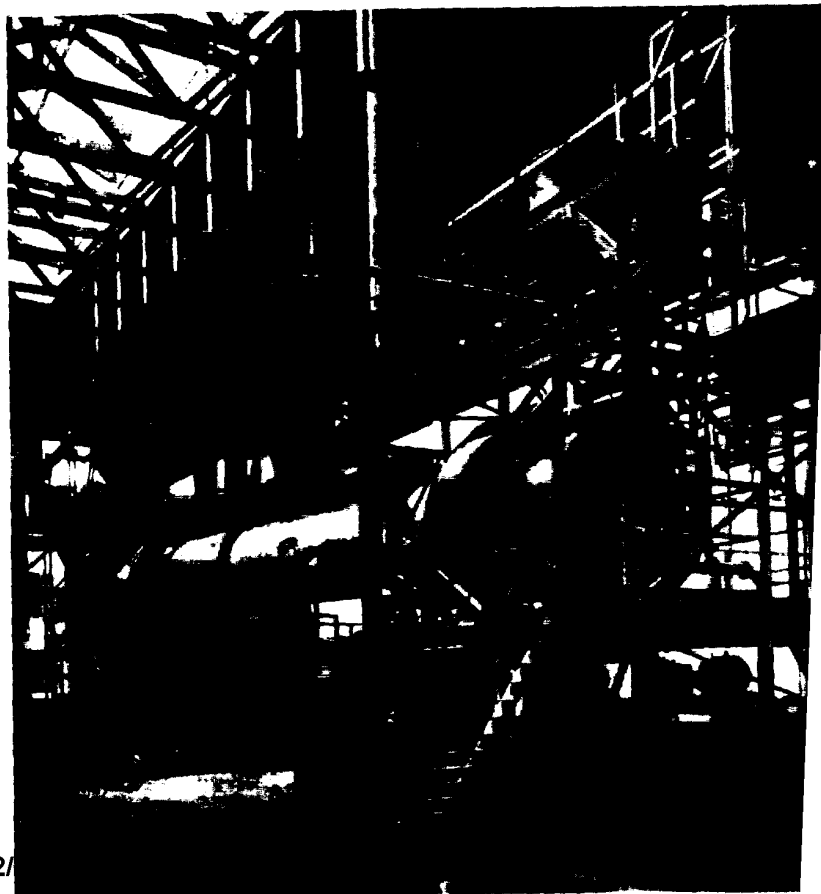
AVIGLIANA
Montecatini Co.
Paints Factory
Testing Laboratory



LIVORNO
Soc. Ital.
del Litopone
Litopone Factory

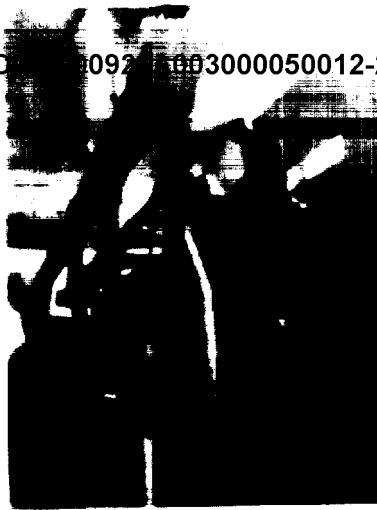
LIVORNO

Litopone Litopone Factory



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Particular of the factory of the Montecatini Co.



CASTELLANZA
(Montecatini Co.)
Particular of the
Phenolic Resins Plant



CASTELLANZA
(Montecatini Co.)
Particular of the
Polystyrene Plant

Plastics The progress of the plastic industry in Italy is mainly due to Montecatini enterprise.

It was greatly helped by the considerable supply of raw materials produced in the course of other activities. The synthesis of methyl alcohol, of urea, of acetic acid and its derivatives supplied the plastic industry with the basic materials it required. At first it turned in Italy almost solely to cellulose products; then production of plastics from synthetic resins was started. This was a field teeming with wonderful possibilities from a technical viewpoint and Montecatini reached decisive results. The first factory for the production of ureic and phenolic resins was built at Castellanza in 1934; another followed at Apuania. But the varied and complex character of these resinous compounds has caused their manufacture to be distributed among a large number of non-specialized Montecatini works. Thus it is that glycerophthalic resins are produced at Avigliana, cellulose acetate is manufactured by Rhodiaceta at Verbania, polyvinyl chloride by A.C.N.A. at Cesano Maderno, vinyl acetate and its polymers by Società Elettrochimica del Toce at Villadossola, nylon at Novara. To these productions, polystyrenic, acrylic and methacrylic resins have now been added.

Fuel and lubricants Montecatini was the first company in Italy to recognize the fundamental importance of the hydrogenation problem, whose results are undoubtedly one of the most important discoveries of modern chemistry.

In 1933 systematic research was begun, especially in the Novara laboratory, in order to throw complete light on the hydrogenation of lignite and heavy mineral oil residues. On February 7th, 1936, A.N.I.C., Azienda Nazionale Idrogenazione Combustibili, was officially set up; this was the first case of a financial collaboration between the government and private enterprise. Two huge factories were then built at Bari and Livorno, capable of covering the whole range of integral hydrogenation and cracking, starting from crude oil.

The factories were finished in 1938, and were such as to answer all technical requirements in Italy, covering an area of 125 hectares, with tanks of 350,000 cubic meters capacity, and pipes 1,000 kms long. Buildings measured about a quarter million cubic meters, and both factories required about 130 million kWh yearly.

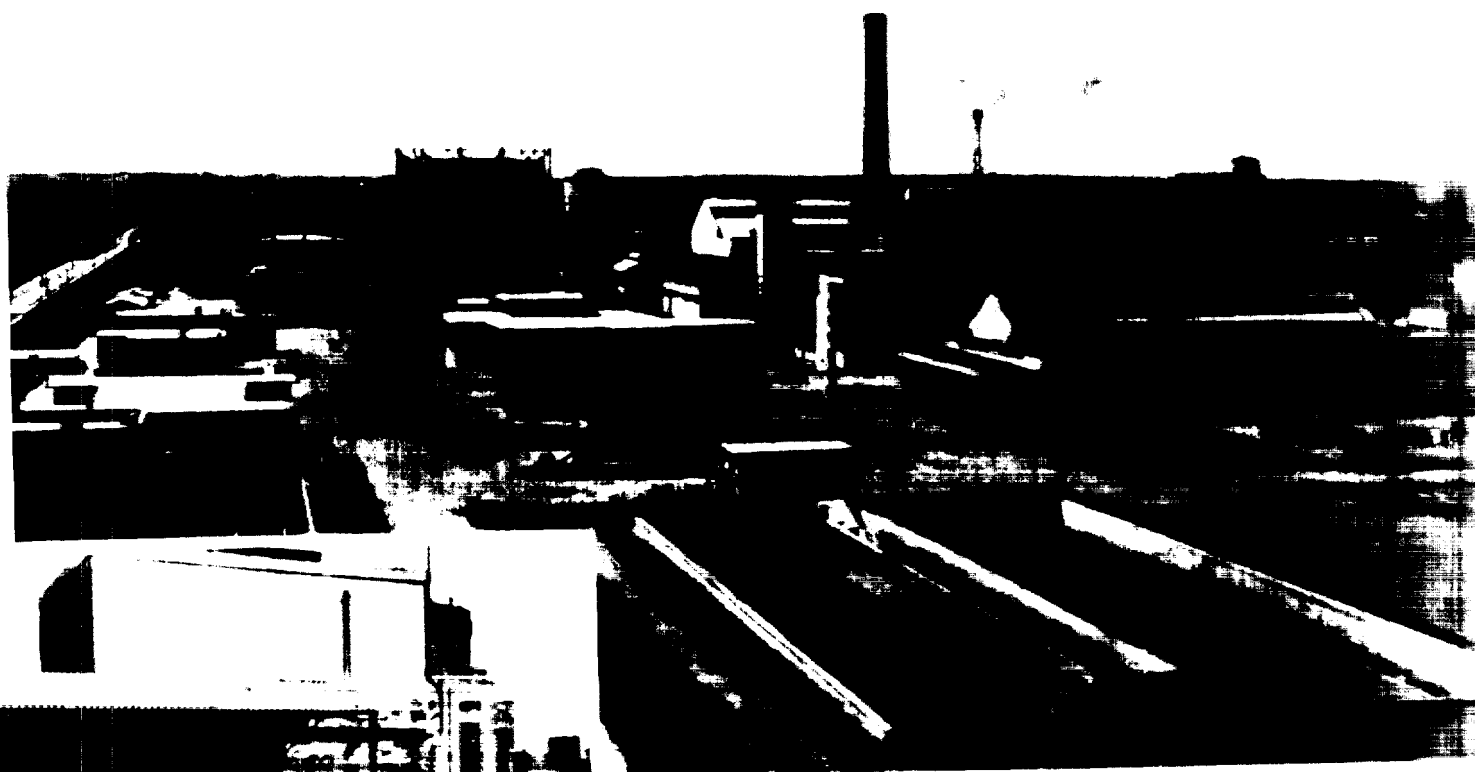
In 1940 a third plant was built at Novara, in order to produce catalysts; in 1941 the lubricants and paraffines sections of Livorno refinery started producing. These new plants would have been capable of supplying about 70% of Italian needs in all

LIVORNO (A.N.I.C.)



EARL
A.N.I.C.
External Plant of the Destillers

ducts will be further improved and expanded. The vast reorganization work which is scheduled to begin. In this case Italy too will come to possess a modern chemical industry, like that which, especially in the U.S.A. and Great Britain, has considerably progressed above all as regards the manufacture of synthetic rubber, amines, resins and olefinic derivatives generally. Also in the field of fatty acids from paraffin A.N.I.C. has made considerable progress, putting some interesting products on the market.



BARI - ANTI-UG

NOVARA
ANTI-UG
Plant for chemical treating of Petrol

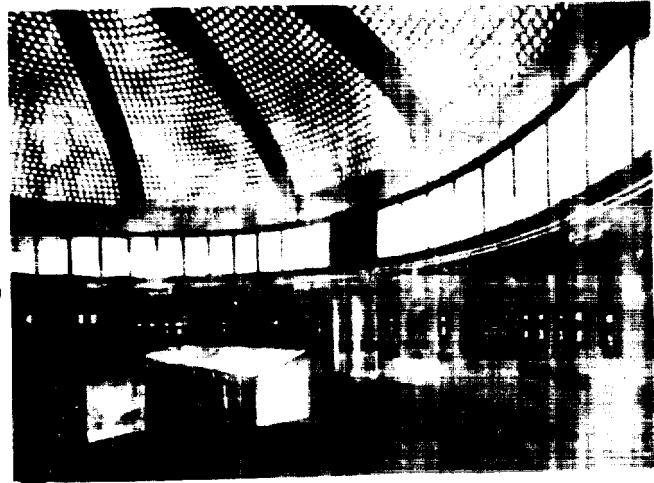
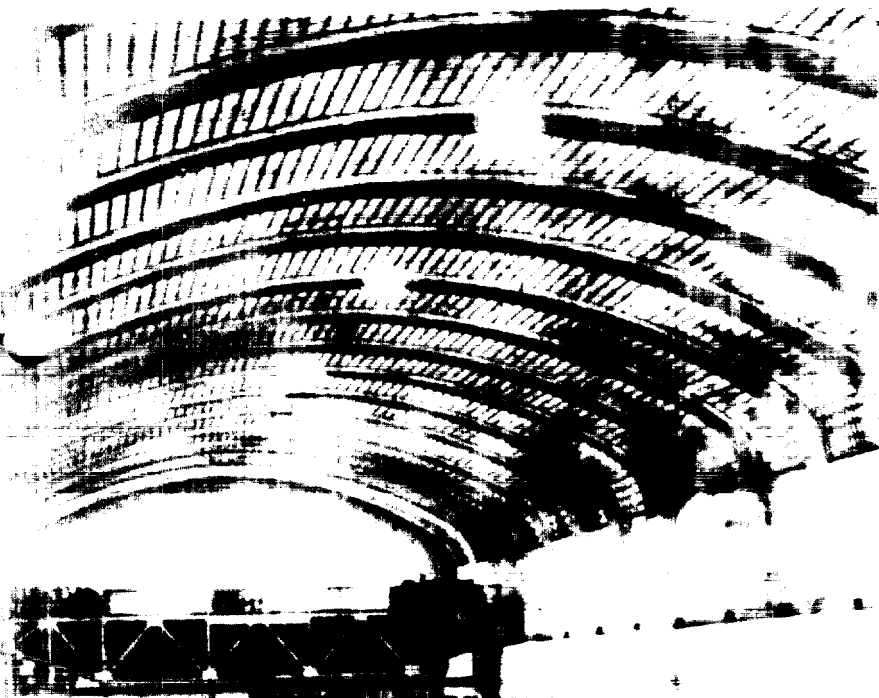
these products. The Germans, however stripped, all the machinery from the Livorno plant, while the buildings themselves were destroyed during the war; fortunately the Bari refinery came through the war without damage and has been working normally since 1946.

Novara also remained intact and research work has been actively resumed, while some special productions were added, such as synthetic fats, emulsifiers, oils for the textile and mechanical industries, sulphonated alcohols, diluters and lubricants. The considerable results already reached in producing and selling mineral oil pro-

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SAN GIUSEPPE - CAIRO
MUSEO
FOTOGRAFIA DI GIOVANNI S. L. G.



SECRET 1933115

Electrical power For the development of the country the Government needs very large quantities of electrical power, which amount to 200,000,000 kWh per year. Power production by Montecatini consists of power stations specially built for the synthetic nitrogen industry.

In the years 1935-1939, 12 new electrical power stations were newly built or expanded at Fed. Marfengo and Merano in the Adige Valley, Battiglio in the Ossola Valley, and San Giuseppe di Cairo (this one a thermoelectrical station).

The development of the aluminum industry successively required the construction of new power stations. They were built at Premesa (Val Gardena) (15,000,000 kWh yearly), Ponte Gardena (a station dug into the mountainside, capable of 240,000,000 kWh per year) and Bressanone (600,000,000 kWh yearly; this one is operated by Montecatini but owned by the Italian State Railroads). Construction was then begun at the big stations of Laghi di Resia, which will be completed within 1949, and will give, with the new power stations at Glorenza and Castalbello (both excavated in the mountainside) a further contribution of about 650,000,000 kWh per year.

All stations of the Montecatini Concern are connected with one another and with consumption centers by means of a transport net which comprizes about 240 Kms of 230 KV cables, 700 Kms of 13.5 KV cables, about 160 Kms of 60-70 KV cables, and nearly 200 Kms of lower tension cables (from 35 down to 5 KV).

(1) i. e. two thousand million.

Line on the 30 KV net for
transport of Electric Power





ALFA
Montecatini Group
Textile Mill

Jute mills A large number of jute mills were needed yearly to pack chemicals for agricultural use; Montecatini decided to manufacture them directly, taking over two Companies, Società Jutifici Spezia and Società Jutificio Romagnolo, which were merged under the style of Società Jutifici Riuniti, and in 1910 came to be part of the Montecatini Concern.

When war caused jute to disappear from the market, Montecatini changed over to other textile materials—chiefly hemp, which were grown in Italy.

Production of jute is today equal to 50% of pre-war figures.

SUBSIDIARY ACTIVITIES

Transport In 1940 Montecatini goods transported by land amounted to about 6,710,000 tons yearly; on the sea the total figure was 1,108,000 tons. This huge traffic had been regulated by means of several organizations, concerned both with sea and land transports. Sea transport was taken over by Sbarchi, Imbarchi e Trasporti, an affiliated Company which on Sept. 8th, 1942, was merged with Montecatini proper, which then set up a special maritime service, acquiring ships and docks to handle the transport. A few years before land transport had already been organized, building our own railroads, running special truck services, and reaching an agreement with Italian National Railroads. A land transport agency, S. A. Industriale Ferroviaria, was set up by Montecatini. Autonomous agencies were also established in single ports to discipline the traffic, or agreements were reached with existing organizations, which resulted in setting up special firms, such as Società Industriale Carico e Scarico.

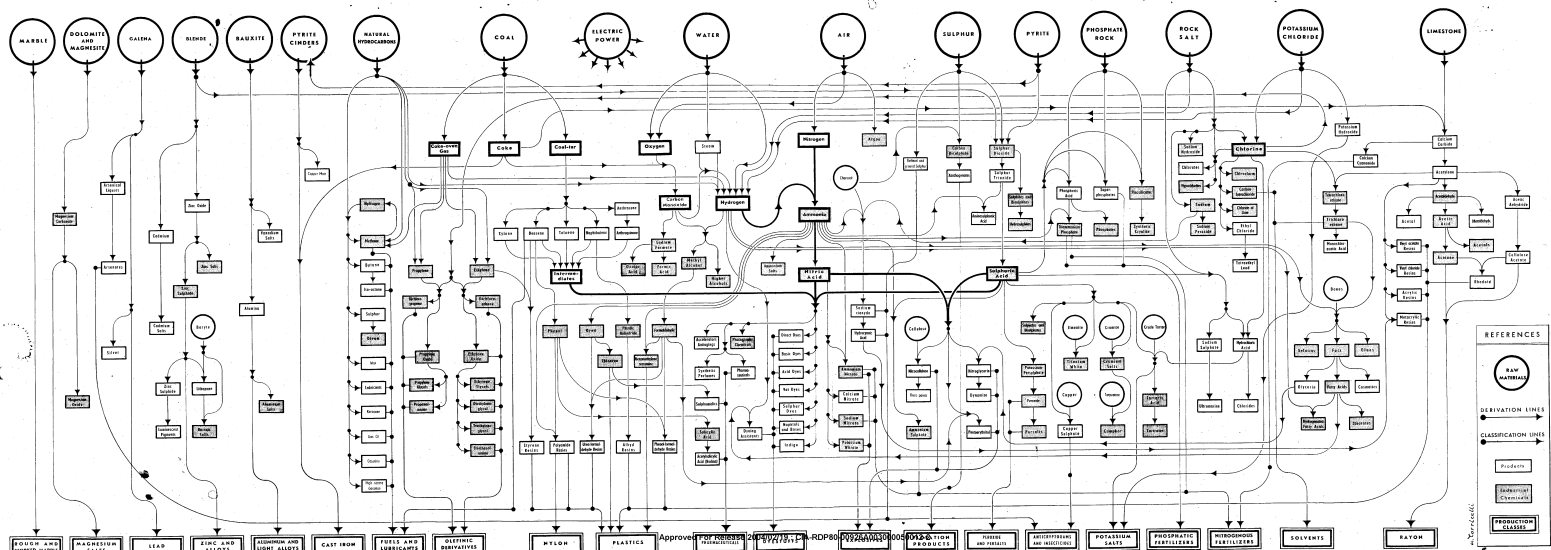
All this complex transport activity of course grew proportionally both with the availability of railroad rolling stock, trucks and ships (at one stage Montecatini owned as many as 7 ships, 5 of which were lost during the war) and with the volume of goods transported, until it was brought to a stop by the war.

Considerable recovery took place in 1947, when in fact Montecatini road and rail transports reached about 2,400,000 tons, which was 20% more than in 1946, while naval transports showed an increase of 100% over 1946. In 1948 land transports showed an increase of about 70% on the 1947 figure (at the end of 1947 the Company owned 128 railroad trucks and hired 149), while naval transports decreased owing to the gradual rehabilitation of the railroad net.



Some transportation means used by the Montecatini Concern

PRODUCTION ACTIVITIES OF THE MONTECATINI CONCERN



PRODUCTION ACTIVITIES OF THE MONTECATINI CONCERN

PRODUCTS

A complete list of all mining, chemical and metallurgical products manufactured by Montecatini would cover many pages, far exceeding the purposes and limits of this booklet.

In order however to give a general idea of the variety and range of Montecatini production (comprising all amalgamated and affiliated companies) we shall append a list of the categories of the principal products, so as to complete the picture of production cycles which has been given in the previous chapter.

■ Mining Products

Pyrite, pyrite cinders, sulphur, blende, galena, lignite, baryte, bauxite, fluorine, rock-salt, raw and polished marble.

■ Metallurgical Products

Pure aluminium, aluminium alloys, special hematitic and desulphurated cast iron, lead, electrolytic zinc, extra-pure zinc, zama alloys, cadmium, silver, copper and copper alloys.

■ Chemical Products

Coal distillation derivatives (metallurgical and foundry coke, benzol, toluol, commercial and pure oils, light, medium and heavy tar oils, naphthalene, anthracene, electrode pitch and hard pitch, road tars).

Basic inorganic acids (sulphuric, nitric and hydrochloric acid).

Phosphatic and nitrogenous fertilizers.

Anticryptogams and parasitocides (copper sulphate, arseniates, polysulphides, silicon fluorides, simple and coppered sulphurs, pure DDT, Gesarol Geigy 33, etc.).

Calcium carbide, acetic acid and its derivatives.

Electrolytic caustic soda, chlorine and derivatives, metal sodium.

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Inorganic pigments (titanium dioxide, lithopone, iron oxides, lead oxides, chromium and zinc pigments, Prussian blue and ultramarine blue) and organic pigments (Seignale, Seignale luce).

Synthetic resins (phenolic, ureic, polychlorovinyl, acetovinyl, acrylic, methacrylic polystyrenic resins, etc.).

Varnishes and enamels (Duco, Dulox, Titania and Vulcania).

Solvents and plasticizers.

Bone and skin glues, technical and edible gelatins.

Main organic acids (tartaric, formic, oxalic acids and their salts).

Sundry organic products (phenol, phthalic anhydride, synthetic camphor, methanol, formaldehyde, hexamine, ethylenic derivatives, synthetic perfumes, sweeteners, photographic chemicals, auxiliary textile chemicals, vulcanization accelerators, rubber anti-agers, etc.).

Sundry inorganic products (allumina, aluminium salts, hydrogen peroxide, peroxides and persalts, barium salts, bichromates, industrial phosphates, phosphorus derivatives, potassium salts, fluorides, sulphites and bisulphites, hydrosulphites, magnesium salts, silicates, sodium sulphate, carbon disulphide, sodium sulphide, compressed gases, rare gases, etc.).

Activated carbon.

Explosives (shooting powders, dynamites, fuses, mining detonators, etc.).

Dyestuffs of every degree of solidity, for every use for dyeing and printing wool, silk, cotton, rayon, cellulose acetate, nylon, and any other natural or artificial textile fibre; for dyeing leather, paper, wood, rubber, artificial resins, etc. and their intermediates. Pharmaceutical products and patent drugs (chemotherapeutics, antipyretics, analgesics, anesthetics, hypnotics, products for diagnosis, vitamins, hormones, vaccines, alkaloids).

Fuels and lubricants (kerosene, aeroplane and automobile gasoline, Diesel oil, solvents, mineral turpentine, saponifiable oils, white vaseline oils, synthetic fatty acids).

■ Textile Products

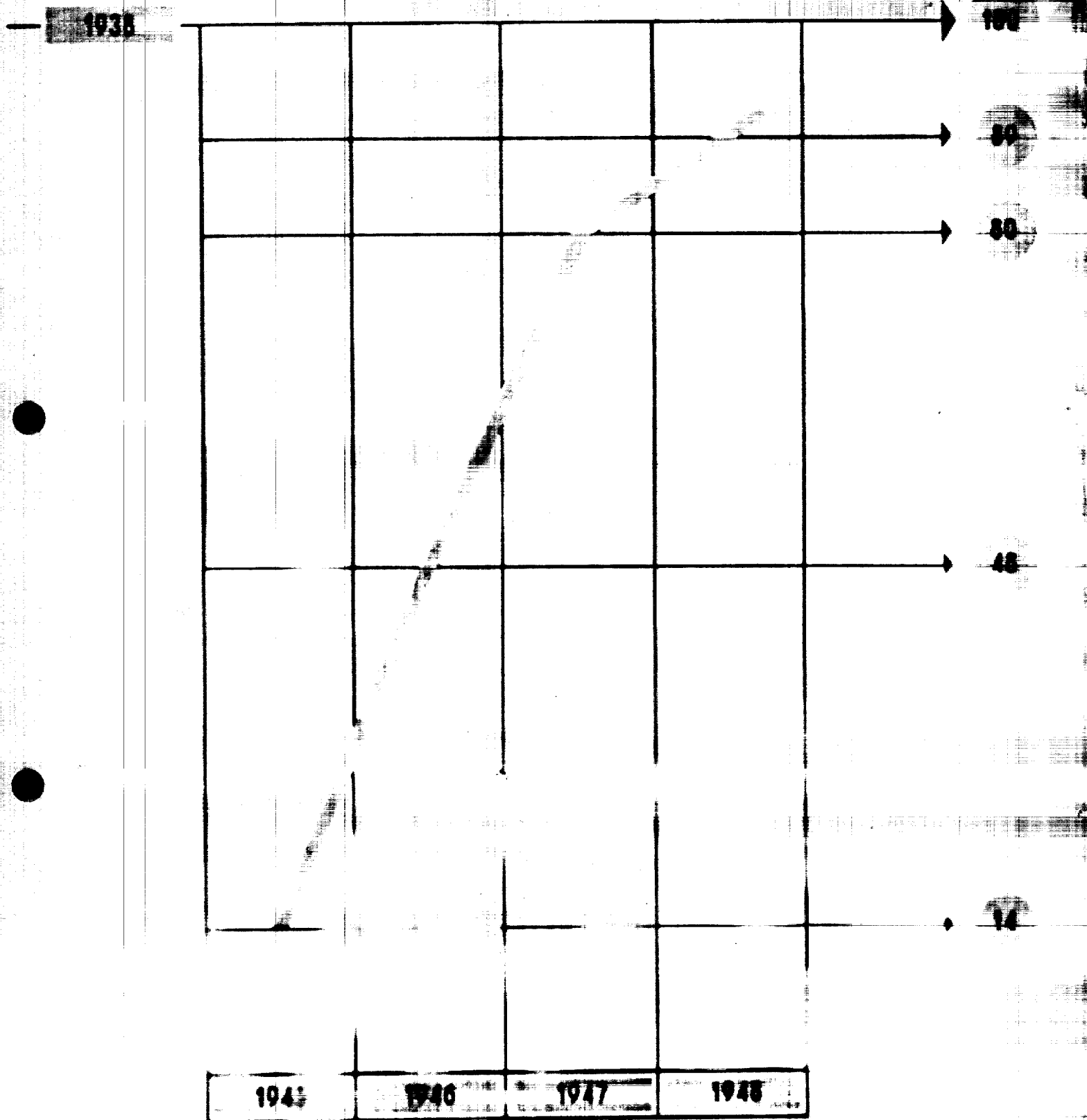
Acetate rayon and staple.

Nylon yarns and bristles.

Jute and hemp thread, cloth and sacks.

■ Electric Power

(both hydroelectrical and thermoelectrical).



RECOVERY INDEX OF POST WAR PRODUCTION OF THE MONTECATINI CONCERN

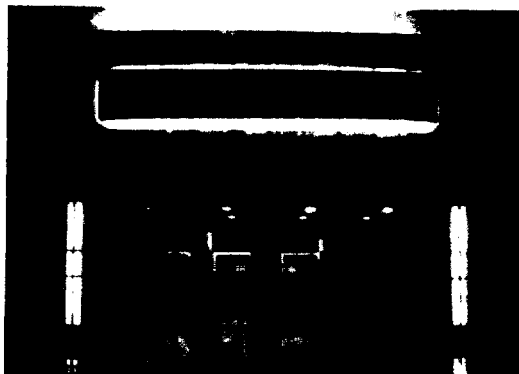
GENERAL ORGANIZATION AND PRODUCTION UNITS

At this point of our description it will be convenient to consider briefly the general organization of the Montecatini Concern, as this is a basic requirement for the knowledge of Montecatini itself.

Montecatini Head Office
Flight of Stairs leading to the Board Offices



Montecatini Head Office
Entrance to Lifts



Generally speaking, organization, in so far as it is a problem of locations, personnel, and special situations, is not tied to rigidly preordinated schedules, but is rather the result of a continuous process of adaptation and improvement. This is especially true in the case of Montecatini, as the organization problems the Company has had to face have necessarily been studied and solved according to original, individual plans. The Concern is harmoniously built according to two fundamental principles, that have governed all its gradual development: a balanced co-existence of centralization and decentralization, and a superior unity of purpose, which takes into account different industrial needs and tendencies.

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The Montecatini Company proper comprises a number of production units, directly connected with the industries in which the Concern has an interest, besides technical, commercial and administration services and departments which integrate and assist all industrial activities both of Montecatini and of the single affiliated Companies. The Board of Directors of the Montecatini Concern is formed as follows :

| | |
|---------------------------|--|
| <i>Chairman</i> | Ing. Giuseppe Mazzini |
| <i>Vice-Chairman</i> | Ing. Giacomo Fauser |
| <i>Managing Directors</i> | Dr. Carlo Faina Dr. Luigi Morandi |
| <i>Directors</i> | Avv. Mario Abbiate Sig. Blass Heinrich Sen. Avv. G. B. Boeri Avv. Prof. Ugo Forti Charles Joseph Farnier Sig. Louis Galicier Avv. Camillo Giussani Prof. Ettore Mancini Sig. Alberto Manzi Fè Dr. Bruzio Manzocchi Sig. Albert Nussbaumer Rag. Carlo Orsi Dr. Prof. Leopoldo Piccardi Prof. Adolfo Quilico Sig. Dandolo Francesco Rebua On. Umberto Sannicolò |
| | |

The managing directors are assisted by three General Executive Boards, of a technical, commercial, and administrative character respectively (called *Direzione Generale Tecnica*, *Direzione Generale Commerciale*, *Direzione Generale Amministrativa*), as well as a Central Executive Board for the electric power supply.

This is the list of executive offices and service departments, grouped according to their different activities :

■ Production

Executive office for electric power supply (comprising a Technical office for power production and transport; a Technical office for power line construction; a Technical office for hydroelectrical station construction; a Thermoelectrical technical office).

Technical executive office for mining activities.

Technical executive office for chemical products for agriculture.

Technical executive office for nitrogen products.

Technical executive office for chemical products for industry.

Technical executive office for resins and glues.

Executive office for marble (with commercial department).

Executive office for jute mills (with commercial department).

Lubricants section (with commercial department).

Pesaro foundry.

■ Sales and Purchases Departments:

Executive office for the sale of chemical products for agriculture — Advertising is looked after by the Agricultural technical office.

Executive office for the sales of chemical products for industry.

Executive office for the sale of resins and sundry products.

Executive office for minerals and raw materials.

Executive office for foreign relations.

Executive office for supplies.

■ General and Administration Service Departments:

General affairs office.

Legal office.

Staff and labor bureau.

Head accountancy office.

Financial office.

Inspectorship department for shares.

Inspectorship department for managements.

Managing office of the economical departments (Economics, statistical, patents and technical documentation, advertising, mechanographical departments).

Technical executive office for plans and studies.

Building department.

Transport department.

Sea transport department.

Department for recovery of sundry materials.

Branch-offices, supplementary offices and agencies, situated in the main Italian centers, insure normal trade activities. Branch-offices, direct agencies, and representative agencies make up the Montecatini foreign trade organization, which extends to all the principal countries in the world.

The Concern also owns financial interests and shares in several Italian and foreign firms. We give here a list of financial interests of Montecatini in Italy and abroad; their number and importance will help to show the dominant position Montecatini occupies in industry generally.

Montecatini

■ Montecatini's Financial Interests Abroad

Soc. Elettrochimica del Toce

Soc. Finanziaria per lo Sviluppo
delle Industrie e dell'Agricoltura

Soc. Idroelettrica Alpi Retiche

Soc. Idroelettrica Atesina - S.I.A.

Soc. Industriale Carico e Scarico

Soc. It. Carboni Attivi - S.I.C.A.

Soc. Italiana del Litopane - S.p.a.

Soc. Rhodiaca Italiana - S. A.

Tecnogas - S.r.l.

Timor Italiana - S.p.a.

Unione Raffinerie Siciliane

Ammoniaque Synthétique et Déri-
vés (Brussels)

Compagnie Européenne de Traite-
ment Minerais (Bordeaux)

Compagnie Néerlandaise de l'Azote
(Sluiskil)

Continental Raffinerie de
Huile (Marseille)

Fabrication de Anilinas y Pro-
ducts Chemical (Barcelona)

F.A.P.S.A. (Barcelona)

J. Wirth Aktien-Gesellschaft
Marmo Granit (Köln-Brauns-
feldt)

Many departments (such as sales, legal office, revenue office, etc.) assist also amalgamated and affiliated Companies, thus helping to intensify co-operative relations, from which Montecatini and its depending Companies derive great advantages and mutual strength.

The Board of Directors and the General Executives Boards are situated in Milan. An agency of our Head office was early set up in Rome; now, having developed and expanded to a considerable importance, it controls and manages all matters pertaining to Central and Southern Italy and it looks after the Concern's relations with Government offices and Departments. An executive office was established in Rome for the sales in Central and Southern Italy and Islands.

Italian Companies Associated or Affiliated to

| | |
|-----------------------------------|------------------------------------|
| Agenzia Vendita Zolfi Lavorati | Istituto Sperimentale dei Metalli |
| Agraria Friulana | Leggeri - I.S.M.L. |
| Alluminio S. A. - A.S.A. | Lavorazione Leghe Leggere - S. A. |
| Azienda Nazionale Idrogenazione | L.L.L. |
| Combustili - A.N.I.C. | Metallurgica Feltrina - S.p.a. |
| Aziende Colori Nazionali Affini - | Metallurgica Nazionale - F.A.C. - |
| A.C.N.A. | S.p.a. |
| Cokapuania S. A. | Montevecchio Soc. It. del Piombo |
| Cokitalia S. A. | e dello Zinco |
| Farmaceutici Italia - S. A. | Nobel - Società Generale di Esplo- |
| Fermonte - S.p.a. | sivi e Munizioni - S. A. |
| Ferdinando Zanoletti Metalli | S. A. Industriale e Ferroviaria |
| Graniti d'Italia - S.p.a. | Soc. Approvvigionamenti Indu- |
| Industria Nazionale Alluminio - | striali - S.A.I. |
| I.N.A. | Soc. Esportazione Travertino Ro- |
| | mano - S.p.a. - S.E.T.R.A. |

■ Production units

The picture of our general organization must be completed with a list of production units (factories, plants, mills, mines, quarries, etc.) belonging to Montecatini and to all affiliated Companies, and grouped according to the different production cycles.

| Montecatini | |
|---|---|
| Electric power (Hydroelectrical and thermoelectrical power stations connected with the transport net) | Marlengo, Premesa, Battiggio, Bressanone (operated by Montecatini, but owned by the Italian State Railroad), Mori, Rio Valles, Glorenza, Castalbello (in process of construction), S. Giuseppe di Cairo, Ponte Gardena. The Concern owns other power houses which are exclusively used for the single works to which they belong. |
| Mines | Agordo, Brozzo, Boccheggiano, Calceranica, Cabernardi, Fenice Capanne, Gavorrano, Gimigliano, Formignano, Lombardo, Montieri, Niccioleta, Prestavel Percozzone, Perticara, Rigoloccio, Ribolla, Ravi, S. Giovanni Rotondo. (There are moreover 25 units at present inactive, including mines and prospectings). |
| Sulphur refineries | Bellisio, Cesena. |
| Chemical products for agriculture | Abbadia di Stura, Bra, Borgo Panigale, Bagnoli, Barletta, Bicocca (Catania), Brindisi, Casale Popolo, Castelguelfo, Campofranco, Legnago, Licata, Milano, Montebelluna, Orbetello, Piazzola sul Brenta, Pontecagnano, Portici, Porto Recanati, Porto Marghera, Piano d'Orta, Romano Lombardo, Ravenna, Rifredi, Roma Tusculana, Rieti, Taranto, Tommaso Natale, Verucelli, Vicenza, Montemarciano, Reggio Emilia, S. Giorgio di Nogaro, Assisi, Castelflorentino, Pavia (in process of construction), Spinetta Marengo, Cagliari. |

As we mentioned in our introductory pages — war damages to production units were indeed heavy: they could not possibly be other than such, as our factories and mines are situated all over the Italian Republic.

Reconstruction however — as we also said before — has been quick and efficient: so here is the list of *production units working at present*:

Company

| | |
|--------------------------------|---|
| | |
| Nitrogen | Avenza Apuania, S. Giuseppe di Cairo, Crotone, Merano Sinigo, Novara, Mas. |
| Calcium carbide and cyanamide | Avenza Apuania, Domodossola, S. Marcel. |
| Chemical products for industry | Arquata Scrivia, Barletta, Milano Bovisa, Milano Bruzzano, Livorno, Milano Linate, Milano Morsenchio, Spinetta Marengo. |
| Paints and resins | Avigliana, Castellanza. |
| Glues and gelatins | Foligno, Roma Praenestina, Saronno, Treviglio, Torino A. B., Torino C. D., Udine. |
| Marble | Carrara, Avenza Carrara, Fiorino Carrara, Doganella Carrara, Pietrasanta, Viareggio, Gramolazzo Garfagnano, Bagni Tivoli, Guidonia, Cesana T., Baveno, La Spezia, Milano, Auriama, Serre di Rapolano. |
| Jute mills | Aulla, La Spezia, Ravenna. |
| Lubricants | Milano. |
| Foundries | Pesaro. |
| Scientific Research Institutes | Novara, Carmignano Signa. |

Associated and Affiliated Companies

Montevecchio - Soc. Italiana del Piombo e dello Zinco

**Aziende Colori Nazionali Affini
A.C.N.A.**

Farmaceutici Italia S. A.

**Nobel - Società Generale di Esplosivi
e Munizioni S. A.**

Soc. Italiana del Litopone - S. p. A.

Soc. Italiana Carboni Attivi - S. I. C. A.

Cokapuania S. A.

Cokitalia S. p. A.

**Azienda Nazionale Idrogenazione
Combustibili - A.N.I.C.**

Industria Nazionale Alluminio - I. N. A.

Lavorazione Leghe Leggere S.A. - L.L.L.

Metallurgica Nazionale F. A. C. - S. p. A.

Soc. Rhodiaceta Italiana S. A.

Soc. Elettrochimica del Tocco S. p. A.

**Istituto Sperimentale Metalli Leggeri
I.S.M.I.**

Unione Raffinerie Siciliane

Metallurgica Feltrina S. p. A.

Graniti d'Italia S. p. A.

Montevecchio, S. Gavino, Porto Marghera.

Cesano Maderno, Cengio

Settimo Torinese, Como, Milano (Research Laboratory)

Bussi, Avigliana, Valloia, Orbetello, Taino.

Livorno, Iglesiente, S. Antioco.

Rho

Apuania.

S. Giuseppe di Cairo.

Livorno, Bari, Novara.

Porto Marghera, Mori, Bolzano.

Porto Marghera, Ferrara.

Milano, Bologna, Roma, Padova, Bari, Firenze

Pallanza.

Novara, Pallanza, Villadossola.

Novara.

Catania, Porto Empedocle.

Feltre.

Baveno.

The total number of industrial units working at present, both belonging to Montecatini and to all its subordinate Companies is shown in the following table:

| | | | | | | TOTAL |
|-----------------------------------|---|---|------------------------------------|----------------|--------------|-------|
| Electric Power Stations | | | | | | 10 |
| Mines | Pyrites 10 | Sulphur 4 | Galena and Blende 1 | Copper 1 | Lignite 1 | 22 |
| | Fluorspar Barites 2 | Bauxite 1 | Barites and Calamine 2 | | | |
| Refineries | Sulphur 4 | | | | | 4 |
| Fertilizers | Phosphatic Fert. 38 | Nitrogenous Fert. 6 | | | | 44 |
| Calcium Carbide and Cyanamide | | | | | | 3 |
| Chemical Products for Industry | | | | | | 14 |
| Dyestuffs, Resins and Paints | | | | | | 4 |
| Glues and Gelatins | | | | | | 7 |
| Fuel and Lubricants | | | | | | 3 |
| Explosives | | | | | | 3 |
| Rayon and Nylon | | | | | | 3 |
| Coke oven Plants | | | | | | 2 |
| Pharmaceutical Products | | | | | | 2 |
| Metals | Lead 1 | Electrolytic Zinc 1 | Cast Iron and Alloyed Iron 1 | Recasting 6 | | 9 |
| Light Metals | Alumina and Aluminium 3 | Light Alloys and Half- processed Metals 3 | | | | 6 |
| Marble and Granite | Quarries, Laboratories and Saw Mills 16 | | | | | 16 |
| Jute Mills | | | | | | 3 |
| Scientific Research Institutes | | | | | | 4 |
| General Total of Units | | | | | | 159 |

SCIENTIFIC RESEARCH

The gradual development of Montecatini has of course required a parallel development in scientific research laboratories. In this field too Montecatini has kept abreast of the largest chemical firms in Europe, setting up a number of institutions which study, on a scientific basis, the main problems of chemical production, both organic and inorganic. From the factory laboratories, which analyse and test products and are widely distributed all through the Concern, to the larger institutions, such as the Istituto di Ricerche « G. Donegani » (« G. Donegani » Research Institute) Novara, we have a huge scientific organization, which has made it possible to perfect production processes to a high degree and to adjust new productions of basic importance to Italian economy.

The « G. Donegani » Research Institute, Novara is certainly one of the largest in Europe; with annexed service facilities (housed in a whole group of buildings) it covers a total area of 40,000 square meters, 20,000 of which are occupied by laboratories alone. The apparatus for scientific research and technological tests is one of the most complete and modern that science may wish to have today.

The field of activity is very vast, as it covers the whole range from theoretical chemical and chemical-physical study to complete elaboration, from laboratory work to the projecting of pilot-plants for new productions required for the development of Montecatini, from complex chemical fertilizers to the newest heat-resisting synthetic resins, from the recovery of valuable metals to the preparation of ever better catalysts for all sorts of organic and inorganic reactions, from technological studies aiming to further improve chemical apparatus to research on the possibility of extending the field of application of all chemicals, from the elaboration of new electro-chemical processes to the industrial exploitation of agricultural products. Also at Novara there is the Istituto Sperimentale dei Metalli Leggeri (Experimental Light Metals Institute), covering an area equal to one third of the above-mentioned Institute's, and working both for Montecatini and the Swiss Group of Aluminium Industrie A. G.

The Experimental Institute is the most modern organization in Europe in the field of metallurgical and metallographical research, with special regard to light metals. It is equipped with complete laboratories for analytical chemistry, spectrography, micro- and macrostructural Roentgenography, etc., besides a full equipment of static



Fig. 1
Experimental Institute
for Light Metals

and dynamic machines for metal test, and technological workshops comprising foundries, rolling mills, embossing and stamping machines, etc.

With all this apparatus, and with the assistance of a large number of specialized technicians, the Institute is capable of undertaking any metallurgical or metallographical research work on all technological stages of metals and, consequently, of studying the possibility of producing also semi-industrially new alloyed light metals. One of the latest and most important successes of the Institute is the preparation of a new range of light alloys for industrial production. These alloys, named Ergal, support a tensile strength of 75 kgs. per square mm. have an elongation of over 10%, and a Brinell hardness of 190 to 220 kgs per square mm. The Experimental Institute publishes a bi-monthly magazine (« Alluminio »), besides issuing, through its own documentation office, a Bibliographical Bulletin, containing summaries of the most interesting publications in the field of light metals and general metallurgy. Also at Novara there is the laboratory of our affiliated Company, A.N.I.C., which mainly carries out research work in the field of hydrocarbons and catalysts and explores all problems regarding hydrogenation.

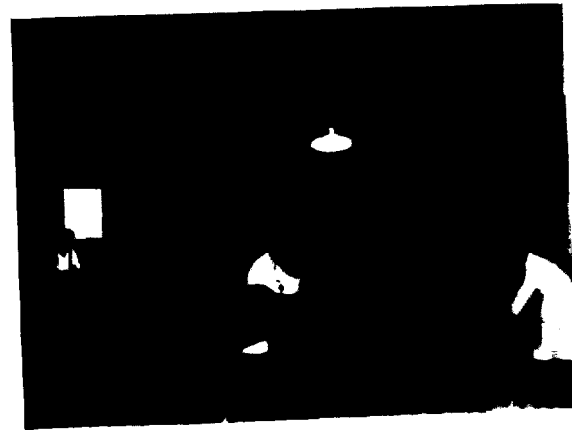
Important are also the laboratories of the Società A.C.N.A., at Cesano Maderno and Cengio. The latter mainly studies ways and means to improve working processes while the former, which is also the more important of the two, conducts research mainly regarding dyestuffs, intermediates and subsidiary products, without neglecting, however, other fields of organic chemistry. A particular mention must be made of the Experimental Dye-works, which has the intermediate task of linking



CESANO MADERNO Research Laboratory of the A.C.N.A. Co.



NOVARA
Experimental Institute
for Light Metals



producing and consuming industries, and studies all problems regarding the application of dyestuffs to dyeing and printing processes. Farmaceutici Italia have two important research centers in Milano and Settimo Torinese; the former has a biological and pharmaceutical character, while the latter is concerned with working out manufacturing processes of new products. Other research laboratories are situated at Spinetta Marengo (chiefly for research on pigments), Castellanza (for synthetic resins), Avigliana (for varnishes), Carmignano-Signa (for studies on agricultural chemistry connected with the manufacture of phyto-drugs), Cesano Maderno (for special organic syntheses), Pallanza and Novara (Società Elettrochimica del Toce) for Nylon, Porto Marghera and Mori (Società I.N.A.) for aluminium. The research activities of the Concern are co-ordinated and directed by a Research Council, comprising Montecatini's best technicians and representatives of the University Institutes.

SOME ECONOMICAL DATA AND STATISTICAL FIGURES

The Montecatini Concern prides itself on never having, during its sixty years' existence, had recourse for financial help to the State, even in the most critical periods of world and Italian economy. Temporary difficulties and the need of fresh capital for expansion have always been met with the resources of Montecatini itself or of the affiliated Companies, or else by having recourse to private capital. The Company's starting capital in 1888 was two million Lire; since then it has gradually increased, owing to expansion needs and the revaluation. We give here a table showing the variations of the Company's capital, together with net profits and dividends per share.

■ Capital • Profit • Dividends

| Financial Year | Capital (thousand Lire) | Net Profits (thousand Lire) | Dividends (Lire) |
|----------------|----------------------------|--------------------------------|---------------------|
| 1888 | 2,000 | 215 | 5 |
| 1898 | 2,500 | 751 | 25 |
| 1908 | 6,500 | 56 | — |
| 1918 | 50,000 | 6,909 | 8 |
| 1923 | 200,000 | 40,173 | 15 |
| 1928 | 500,000 | 108,117 | 18 |
| 1933 | 500,000 | 65,672 | 8 |
| 1938 | 1,300,000 | 146,316 | 10 |
| 1946 | 4,000,000 | 516,952 | 12 |
| 1947 | 12,000,000 | 1,630,643 | 12 |
| 1948 | 24,000,000 | | |

The capital increases of 1947 and 1948 are due partly to revaluation, following the wartime and post-war decrease in the value of money, and partly to new share issues, which were required to cover the colossal expenses of post-war reconstruction work.

The Company's shares are not concentrated in the hands of a few financing groups, but widely distributed among a large number of small individual savers. It is cal-

culated at present that Montecatini shareholders are as many as 200,000, which represents indeed a democratic financial participation.

We have already mentioned how promptly and vigorously Montecatini conducted the work of post-war reconstruction and reconversion of production units. An indication of the development of the Concern's production, both in the pre-war and post-war periods, is supplied by the following table which illustrates electrical power consumption in the various units scattered throughout Italy.

■ CONCERN CONSUMPTION OF ELECTRICAL POWER (kWh)

| | |
|------|---------------|
| 1920 | 25,000,000 |
| 1925 | 130,729,000 |
| 1930 | 907,745,000 |
| 1935 | 1,373,578,000 |
| 1938 | 1,621,175,000 |
| 1939 | 1,990,626,000 |
| 1940 | 1,059,109,000 |
| 1941 | 2,305,188,000 |
| 1942 | 2,302,249,000 |
| 1943 | 1,901,342,000 |
| 1944 | 1,081,774,000 |
| 1945 | 528,336,000 |
| 1946 | 1,144,399,000 |
| 1947 | 1,650,000,000 |
| 1948 | 1,850,000,000 |

Consumption was highest in 1941, the year of maximum activity; it decreased thereafter, owing to shortages in raw material supply, till it reached a minimum in 1945. After that, it started climbing again, thanks to the intense reconstruction and rehabilitation program.

Total profits, proceeding from delivery of goods sold by the Montecatini Concern.



PONZIGARDENA. Montecatini. View of the industrial plant, partially hidden by the hills in the background.

reached 80 billion ⁽¹⁾ Lire in 1948, as against 21 billion ⁽²⁾ in 1946. The striking increase is of course due to price variation, besides the higher volume of sales. It is well to remember, however, that the Concern has made every effort to keep production costs and selling prices as low as possible, with a view to encouraging consumption.

This low-price policy is made possible by the fact that Montecatini functions as a whole, comprising full and long production cycles, mutually connected and technically interdependent. In this way it is possible to regulate basic raw materials supplies according to the demand of ultimate finished products, avoiding mediation expenses and the tying up of capital in large unnecessary stocks; on the other hand, it is also possible to utilize by-products and reduce wastes, which particularly abound in chemical industry, and, in this way, materials are really utilized and exploited in full.

(1) i. e. 80 thousand million.

(2) i. e. 21 thousand million.

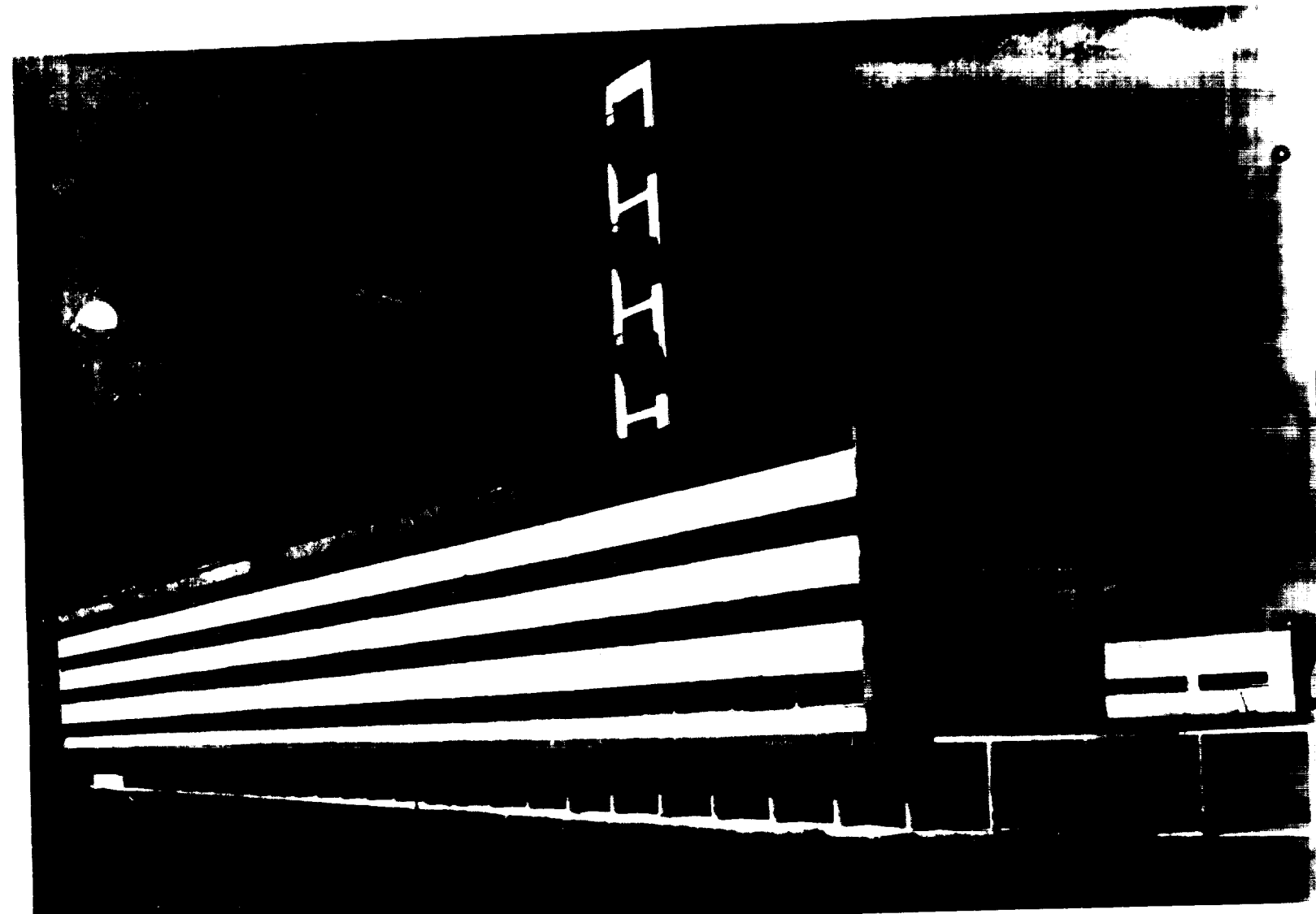


Montecatini Head Office
Employers Dining-Hall

Montecatini Staff

as at October 31st, 1948

| | Montecatini | Affiliated Companies | TOTAL |
|--------------|---------------|-------------------------|---------------|
| Workmen | 33,796 | 11,630 | 45,426 |
| Employees | 5,528 | 1,968 | 7,496 |
| <i>Total</i> | 39,324 | 13,598 | 52,922 |



STAFF

The number of personnel in the employment of the Montecatini Concern, as at the end of October 1948, is shown in the table above:

Personnel reached its peak figure in 1942, with a total of 70,000; the minimum was touched in 1945, at the end of the war, with 35,000. The 1948 figure shows that post-war recovery has been satisfactory; a further increase is expected as soon as general industrial conditions are back to normal.

Scenes of Health Resort Buildings at Cervia
before being destroyed by the war



Montecatini Head On
Dispensary



Montecatini Health Resort
before the war

The whole staff is knit into one big family. Their will to work and technical efficiency are such that they make a sound carefully selected organism. Average seniority of executive personnel is over 20 years.

Montecatini has always looked actively and generously after the welfare of its staff. The gradual development and progressive expansion of the firm has always been accompanied by a parallel improvement in welfare organizations. Every worker has been continuously assisted and looked after in his work, and the resulting factor of individual efficiency has been the mainspring of Montecatini progress.

Welfare work and social assistance start as soon as workers enter the Company; a careful medical inspection assures that every worker is fit for the work he has chosen, or, alternatively, directs him to other work, better adapted to his physical capacities. Hygienic and sanitary assistance, together with measures for the prevention of accidents, accompany the worker all through his period of employment by means of a Workers' mutual assistance organization, which is equipped with modern infirmaries, staffed by excellent doctors and eminent specialists. A good Medical Service assists all Montecatini production units, looking after sanitary installations in the single factories, and assuring good hygiene and an efficient prevention of accidents, which have been constantly decreasing since 1935, until now their rate is 4.85 accidents per 100,000 working hours, while professional illnesses are down to a negligible figure.

Medical assistance extends to workers' families and direct relatives as well, thus looking after tens of thousand of persons. Special care is taken of the staff's children, who are provided with infant-schools and kindergartens, besides free holiday periods on the mountains or at the seaside.

Workers' messes have also been organized in almost all factories, together with factory shops, where workers can buy not only food but also clothing, footwear and other necessities, with a considerable saving of money and time.

Messes and shops were particularly appreciated specially in wartime, as they provided workers with goods not available elsewhere.

The housing problem also has been faced and studied by Montecatini. In the present after-war period this problem has become particularly serious, and Montecatini has consequently multiplied housing projects, especially in places where war damages have been heaviest. Great activity has also been shown by recreation centers (C.R.A.L.), which Montecatini has organized in all out-of-town factories, with education courses, sports, amateur theatricals, etc.

CONCLUSION

The technical results achieved by the Montecatini Concern have been made possible by a number of different factors which it is too long to list; chiefly, however, they are due to the gradual development of new processes and the rational integration of the various productions. In this way it was possible to manufacture a large number of products, chiefly in the chemical field, and thus to keep costs and prices at a comparatively low figure. The nitrogen industry made it possible to produce synthetic fertilizers and a great range of chemical products for industry. Coal distillation derivatives opened up great production possibilities in the field of dyestuffs, drugs, plastics and synthetic fibres. Electrical power produced by Montecatini own stations was used to manufacture aluminium, and a large number of electrochemical products. Certain natural fibres, such as jute and hemp, are consumed by Montecatini itself to pack and ship fertilizers. Of great utility was also the policy of supplying the Italian market first and of exporting chiefly raw materials or intermediates and derivatives, rarely finished products. This resulted in indirect exports which greatly helped Italian economy.

Our products, were readily sold, even in times of crisis, and the usual fluctuations of private consumers' demand never greatly depressed our sales. Lastly, scientific research and prospecting in the mining and chemical fields were actively encouraged with large means and richly equipped laboratories. From the viewpoint of organization, Montecatini took great advantage from the policy of timely intervention in existing industries, which were recalled to a new life by supplying them with fresh capital and modern technical methods; on the other hand, such productions and activities as became of no use or value to its own and the country's economical prosperity were also timely dropped.

From the viewpoint of administration, Montecatini took into careful account its own and other firms' experience, making wisely use of industrial patents; right from the start a choice group of able technicians and purchase-and-sale specialists were put together; great importance was given to the workers' welfare and to social assistance, transport costs were cut by setting up production centers in the vicinity of mines, ports, and consumption markets.

Relations with foreign organizations, of great advantage to the Italian commercial balance, were and are cultivated with the utmost care.

Montecatini late lamented Chairman, Guido Donegani, in a letter which he sent to his friends shortly before his death (which occurred at Bordighera on April 16th, 1947),

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retraced in synthesis the whole history of Montecatini, « a history of successes » which made of Montecatini « the foremost Italian firm in the mining and chemical fields ». Montecatini's work is rightly assessed and celebrated in that farewell letter, but Guido Donegani's words, besides commemorating the past, point out the way for the future. He wrote :

« ...The factories make up the real wealth of Montecatini, a wealth which is at the disposal of the workers and technicians who are employed in them, and to whom it gives bread and work...

« A far-seeing, comprehensive imagination, the ability to translate it into practical working policies, the effort to find a mainspring of success in the constant quality and quantity improvement of our products, increasing the workers' wages and bettering their living conditions while reducing costs and selling prices, these were the secrets of our ever increasing expansion.

« ...You must have faith in the chemical industry and in modern technique, because they contain the seeds of a better future... You must have faith in the spirit and freedom of private enterprise, which is the mainspring of such industry and technique. They are the pillars on which our Company is founded; and it is your duty to develop it and bring it to ever greater perfection and proportions. Its expansion is due to the daily labors of scientists and technicians of our own and of all other countries. It is also due to the daily, ever wakeful, ever exacting labors of executives, conscious of the importance and nobility of our Company's tasks.

« ...Going over the past history of our Company is the best way to see the rigorous logic of its development, to understand — by looking at the road we have covered — which and how long a way our efforts must cover in the future... ».